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PROJECTIONS OF HOUSING AND RESIDENTIAL LAND REQUIREMENTS IN THE COLUC AREA

FINAL REPORT

A Report Prepared for
The COLUC Task Force

By

Clayton Research Associates

May, 1974

ONTARIO MINISTRY OF
TREASURY AND ECONOMICS
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CHAPTER 1

INTRODUCTION

In February, 1974 the COLUC Task Force authorized Clayton Research Associates to undertake a study of future housing and residential land requirements in the COLUC Area. This study was to prepare projections of housing and residential land requirements for the overall COLUC Area and 23 urban places within the COLUC Area for the following periods: 1971-1986, 1986-2001 and 2001-maturity. Maturity is defined as the point in time when an urban place is performing the functions and role defined for it in the COLUC Mature State Plan.

The study was to be done in two phases. Phase 1 was to include the consultant's "best estimates" of housing and residential land requirements for the overall COLUC Area and each of 23 urban places. These "best estimates" were to be based on the assumption that the impact of government activities and programs on housing and land markets within the COLUC Area will continue to be about the same as it has been over the past decade or two.

Phase 2 of the study was to assess the implications for housing and residential land requirements of alternative packages of provincial housing policies, i.e., policies other than those implicit in the "best estimate" projections.

Our Phase 1 Report was submitted to the COLUC Task Force in March, 1974. The present report combines the analysis and findings of both phases of our study into a single final report.

The main body of our report briefly outlines our general approach and presents the housing and residential land requirement projections. For the reader interested in the detailed analyses underlying our projections, a series of technical appendices are also included.

The reader is urged to exercise proper caution in interpreting the results of the study. The housing and residential land requirement projections are the product of numerous assumptions related to population growth, population age distribution, average household size, housing preferences, housing cost/income relationships, housing mix and density ratios. An effort has been made in the technical appendices to make our assumptions explicit. In addition, sufficient statistical material is included to allow the reader to readily calculate the implications for residential land requirements of alternative assumptions which he or she might consider to be more reasonable.

Chapter 2 of the report outlines our general approach for projecting housing requirements by type and residential land requirements for the overall COLUC Area. In addition, our "best estimate" projections of housing and residential land requirements for the 1971-1986 and 1986-2001 periods are set forth.

Chapter 3 briefly describes a computer model developed

especially for this study to assist in the allocation of overall COLUC Area housing and residential land projections to 23 urban places. Our "best estimates" of housing and residential land requirements by urban place for the 1971-maturity period are also presented.

And Chapter 4 considers the implications for total residential land requirements in the COLUC Area of five alternatives to our "best estimate" projections. Land projections by urban place for one of the alternatives are compared with the "best estimate" projections over the 1971-maturity period.

CHAPTER 2

PROJECTIONS OF HOUSING AND RESIDENTIAL LAND REQUIREMENTS FOR THE COLUC AREA, 1971-2001

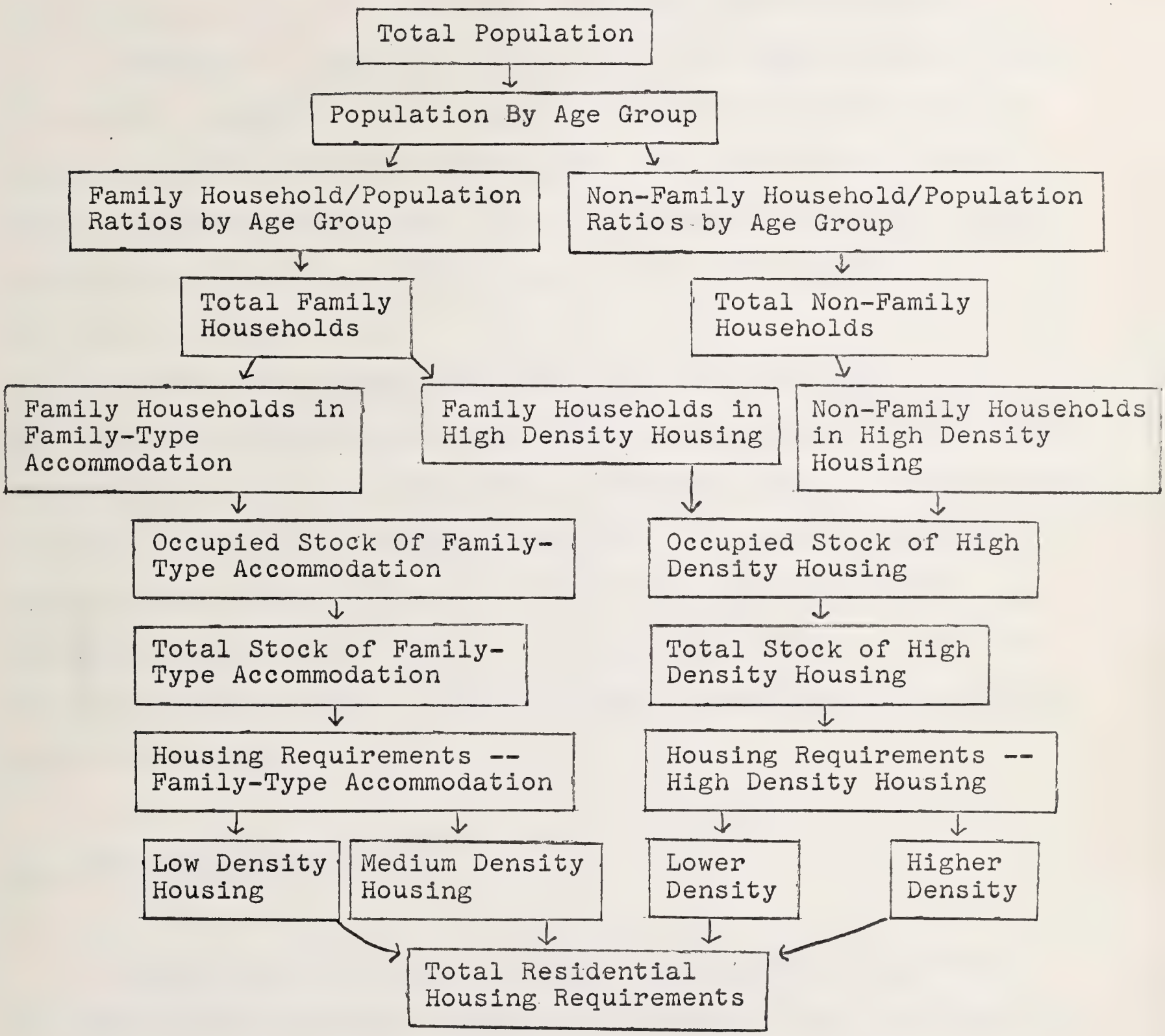
Preparation of our "best estimate" projections of housing and residential land requirements for the 1971-1986 and 1986-2001 periods is done in two stages: firstly, projections of housing and land requirements for the overall COLUC Area are prepared and, secondly, these projections for the overall COLUC Area are allocated among 23 urban places. This chapter briefly describes the approach used to develop the overall COLUC Area "best estimate" projections of housing requirements by type and residential land requirements and summarizes the actual projections.

1. GENERAL STRUCTURE OF OVERALL COLUC AREA RESIDENTIAL LAND REQUIREMENTS MODEL

Chart 1 outlines the variables which form part of the model used to generate projections of housing requirements by type and total residential land requirements for the overall COLUC Area.

Total population is separated into six age groups. Total family and non-family households are forecast by multiplying the population in each age group by the appropriate household/ population ratios.

Chart 1: STRUCTURE OF OVERALL COLUC AREA RESIDENTIAL LAND REQUIREMENTS MODEL


Total Population
Population By Age Group
Family Household/Population Ratios by Age Group
Non-Family Household/Population Ratios by Age Group
Total Family Households
Total Non-Family Households
Family Households in Family-Type Accommodation
Family Households in High Density Housing
Non-Family Households in High Density Housing
Occupied Stock Of Family-Type Accommodation
Occupied Stock of High Density Housing
Total Stock of Family-Type Accommodation
Total Stock of High Density Housing
Housing Requirements -- Family-Type Accommodation
Housing Requirements -- High Density Housing
Low Density Housing
Medium Density Housing
Lower Density
Higher Density
Total Residential Housing Requirements

Non-family households are assumed to live in high density housing (high-rise apartments) while family households live in both family-type accommodation (e.g., single-detached, semi-detached, and duplex houses, and townhouses) and high density housing.

Estimates of "normal" vacancy rates are applied to the stock of occupied family-type accommodation and high density housing to produce projections of the total stock of each of these housing types. Housing requirements are calculated by taking the increase in the total housing stock between the end and beginning of a specified time period.

Housing requirements are then separated into four types of housing: low density (single-detached, semi-detached and duplex units), medium density (row units, townhouses, etc.), lower-density high density housing (suburban type high rise units) and higher-density high density housing (central city high rise units). Finally, density ratios (units per acre) are applied to each type of housing requirement in order to project total gross residential land requirements.

1. HOUSEHOLD PROJECTIONS*

Projections of total population and the age composition of the COLUC Area population for the years 1986 and 2001 were provided

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*See Appendix A for a complete description of the household projections.

by the COLUC Support Staff. Household/population ratios by age group of population for 1986 were based upon preliminary projections in a recent Central Mortgage and Housing Corporation study dealing with net household formation in census metropolitan areas in Canada.* Ratios for the year 2001 were derived by the consultant from data included in the CMHC study. Projections of households were made by multiplying the population projections by age group for 1986 and 2001 by the relevant household/population ratios.

Total population of the COLUC Area, according to the projections provided us by the COLUC Support Staff, is expected to increase to almost 5.7 million persons in 2001 from about 3.3 million persons in 1971.** Total households in the COLUC Area are expected to increase rapidly from approximately 985,000 households in 1971 to about 1,700,000 and 2,400,000 households in 1986 and 2001 respectively.

The growing relative importance of non-family households which has characterized the postwar period throughout the country is expected to continue in the COLUC Area over the 1971-2001 period. Non-family households as a proportion of total

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*John S. Kirkland, Demand for Housing in Canada (Ottawa: CMHC, 1973).

**Table 1 at the end of the chapter summarizes the COLUC Area projections of population, households, housing requirements, and residential land requirements.

households are projected to increase from an estimated 20 percent in 1971 to about 29 percent in the year 2001. Average household size is expected to decline from 3.4 persons in 1971 to 2.6 persons in 1986 and 2.4 persons in 2001.

2. PAST TRENDS IN HOUSING STARTS BY TYPE*

As a basis for converting our household projections into housing requirements by type, an analysis was undertaken to identify and to try to explain trends in housing starts by type in the COLUC Area over the past 10-15 years. As part of the analysis trends in the COLUC Area were compared with selected other areas.

Several interesting features were found in the past pattern of housing starts in the COLUC Area. Firstly, apartments have been a prominent component of total housing starts as far back as the early 1950's, accounting for about one-third of total starts at that time. Secondly, during the late 1950's and the decade of the 1960's apartment starts as a proportion of total housing starts moved sharply upward. This was part of a nation-wide trend. Thirdly, apartment starts as a proportion of total starts declined sharply during the early years of the 1970's. Again, this relative decline in apartment starts appears to be a nation-wide phenomenon. Lastly, semi-detached, duplex and row dwelling units

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*See Technical Appendix B for a complete analysis of past trends in housing starts by type of unit in the COLUC Area.

in the early 1970's accounted for a significantly greater share of total housing starts in the COLUC Area than in the earlier periods.

In spite of generally higher levels of family income in the COLUC Area, it appears that over the past decade or two many families who would prefer to live in family-type accommodation, and who could do so in many other parts of the country, have had to occupy apartments. In recent years almost all new apartment construction in the COLUC Area has been of the high rise variety, which is not considered to be a suitable form of housing for families by many observers of the social scene.

The trend toward increased apartment construction in the COLUC Area during the 1960's probably reflected the increased role of non-family households in the housing market and a combination of preferences and rising home-ownership costs (relative to incomes) for family households. Increases in the proportion of families residing in apartments during the 1960's were probably about one-third due to preferences and two-thirds to a housing cost/income squeeze.

In the early 1970's it appears that a major switch has taken place in the type of accommodation preferred by younger families; fewer families under the age of 35 now want to live in apartments.

3. TRENDS IN VACANCY RATES AND NET REPLACEMENT DEMAND*

Total housing requirements in the study are defined to include

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*See Technical Appendix C for a complete discussion of past trends in vacancy rates and net replacement demand.

increases in vacancies and net replacement demand as well as net household formation. Vacant dwellings may be dwellings which have been previously occupied or newly completed units. Net replacement demand represents the net effect on the supply of housing of losses from the stock of housing due to demolitions, fires, abandonments, conversions of residential structures to non-residential uses and net additions to the housing stock from conversions of non-residential structures to residential uses, conversions of single-detached houses into two-unit structures, etc.

It is concluded that the "normal" vacancy rate in the COLUC Area is in the 1.5-2.0 percent range for family-type accommodation and 4-5 percent for high rise apartments.

Past trends in the magnitude of net replacement demand in the COLUC Area can not be reliably determined. What little evidence there is suggests that net replacement demand has been only a small component of total housing requirements in the Area.

4. PROJECTIONS OF HOUSING REQUIREMENTS*

Separate projections of demographic housing requirements (net household formation) and requirements due to increases in vacancies are made for the 1971-1986 and 1986-2001 periods. Because it was

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*Technical Appendix D contains a complete discussion of the housing projections by type of unit.

not possible to obtain reliable data on past trends in net replacement demand and, as it appears that this component of housing requirements is relatively small and is assumed to remain so over the 1971-2001 period, projections of net replacement demand are not made.*

Projections of housing requirements are made for low density housing (single-detached, semi-detached and duplex units), medium density housing (row units, stacked townhouses, etc.) and two groupings of high density housing (high-rise apartments).

A key assumption underlying the projections of housing requirements by type is that the rise in the costs of single-detached houses will outpace the increase in family incomes. Consequently, an increased proportion of family households will be "forced" to live in high-rise apartments.

Over the 1971-2001 period the projections indicate that about 1.5 million new housing units will be required in the COLUC Area. Total housing requirements are about the same over each of the 1971-1986 and 1986-2001 periods.

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*Net replacement demand is likely to remain a relatively small component of housing requirements over the 1971-2001 period providing that: (a) unrealistically low rent ceilings are not imposed on privately-owned accommodation; (b) government subsidized rental direct construction housing programs (excluding rent supplement programs) account for no more than 15-20 percent of total rental housing starts; or (c) that social conditions in the central cities of the COLUC Area do not deteriorate as they have in many large U.S. urban areas.

Almost 70 percent of total housing requirements in each of the 1971-1986 and 1986-2001 periods are projected to be high density units. The proportion of low density units declines from about 19 percent in the 1971-1986 period to 11 percent in the 1986-2001 period while a corresponding increase takes place in medium density housing.

5. PROJECTIONS OF RESIDENTIAL LAND REQUIREMENTS*

The projections of residential land requirements are in terms of gross rather than net acreages. Thus in addition to the sites on which housing is located land for local streets and local community facilities such as schools, parks and shopping centres is included. The land projections are calculated by multiplying housing requirements by type by the appropriate density ratios (units per acre).

The projections of residential land requirements indicate that a total of about 59,500 acres of land will be needed over the entire 1971-2001 period, with almost 60 percent of this land needed during the 1971-1986 period. Most of the land is needed to provide for low density housing. It should be noted that while most of the required land will be previously undeveloped land, a small proportion of the high density housing will likely be constructed on redeveloped sites.

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*See Technical Appendix D for a complete discussion related to these projections of residential land requirements.

Table 1: SUMMARY OF "BEST ESTIMATE" PROJECTIONS, COLUC AREA, 1971-2001

Total Population (000's of Persons)

1971	1986	2001
3,325	4,386	5,678

Increase in Population

	1971-1986	1986-2001
Thousands of persons	1,061	1,292
Percent increase	31.9	29.4

Total Households

	1971	1986	2001
Number of households (000's)	985	1,696	2,394
Percent family households	79.7	72.3	70.6
Percent non-family households	20.3	27.7	29.4
Average household size	3.4	2.6	2.4

Total Housing Requirements (Dwelling Units)

	1971-1986	1986-2001	1971-2001
Demographic	711,000	698,000	1,409,000
Increase in vacancies	27,000	40,000	67,000
Total	738,000	738,000	1,476,000

Housing Requirements by Type (Percent)

	1971-1986	1986-2001	1971-2001
Low density	18.7	11.1	14.9
Medium density	12.3	20.6	16.5
High density-lower	44.9	40.9	42.9
-higher	24.1	27.4	25.7
Total	100.0	100.0	100.0

Density Ratios (Dwellings per Gross Residential Acre)

	1971-1986	1986-2001
Low density	6.0	6.5
Medium density	25.0	35.0
High density-lower	50.0	50.0
-higher	120.0	120.0

Residential Land Requirements (Gross Residential Acres)

	1971-1986	1986-2001	1971-2001
Low density	23,000	12,615	35,615
Medium density	3,640	4,343	7,983
High density-lower	6,620	6,040	12,660
-higher	1,483	1,683	3,166
Total	34,743	24,681	59,424

CHAPTER 3

PROJECTIONS OF HOUSING AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, 1971-MATURITY*

The second stage in developing the "best estimate" projections is the allocation of the overall COLUC Area housing and residential land requirement projections for the 1971-1986 and 1986-2001 periods among 23 urban places. In addition, some very crude projections are made for the 2001-maturity period to enable the COLUC Task Force to appraise the relationship between total residential land requirements in each urban place and the potential supply of vacant land available for residential use.

The projections of housing and land requirements by urban place are assumed to reflect the underlying forces of land economics. Actually, the ultimate residential land requirements in each urban place will be a function of a complex interaction of numerous social, economic, political, environmental and engineering forces over the forecast period.

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*See Technical Appendix E for a complete discussion of the projections of housing and residential land requirements by urban place.

It should be noted that the COLUC boundaries for each of the 23 urban places generally do not correspond with boundaries of municipalities having the same name.

1. THE RESIDENTIAL LAND ALLOCATION MODEL

A computer model developed by Woods, Gordon and Company especially for this assignment was used to allocate overall COLUC Area projections of housing and residential land requirements among 23 urban places.

Briefly, the model begins with an allocation of total COLUC Area population among the 23 urban places. Assumptions as to household size and vacancy rates are inputed and the model calculates total new housing requirements in each urban place. Assumptions of the mix of new housing to be built in each urban place are then inputed. The model multiplies these projections of housing requirements by type by the appropriate density ratios to estimate total residential land requirements by urban area.

2. PROJECTIONS OF RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE

Table 2 summarizes the projections of residential land requirements by urban place over the entire 1971-maturity period. Over this period a need for some 80,000 acres of residential land is projected for the overall COLUC Area.

Of the nearly 35,000 acres of land required for residential uses during the 1971-1986 period in the overall COLUC Area, some

Table 2: PROJECTIONS OF TOTAL RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, SELECTED PERIODS, 1971-MATURITY

	Gross Residential Acres				Total Acres in Urban Place(1)
	1971-1986	1986-2001	2001-Maturity	1971-Maturity	
West Sector	(9,518)	(10,548)	(10,050)	(30,116)	
1. Hamilton	2,675	3,262	776	6,713	49,000
2. Burlington	838	717	353	1,908	20,320
3. North Burlington	14	200	978	1,192	9,640
4. Milton	79	46	121	246	2,800
5. Oakville	497	487	1,423	2,407	23,680
6. North Oakville	6	423	2,125	2,554	10,400
7. Mississauga	2,330	2,091	899	5,320	29,560
8. Erin Mills	1,539	2,200	1,239	4,978	10,800
9. Malton	107	220	98	425	4,080
10. Brampton-Bramalea	1,141	752	1,891	3,784	14,320
11. Georgetown	292	150	147	589	2,920
East Sector	(6,807)	(6,690)	(6,345)	(19,842)	
12. North Pickering	1,003	1,951	1,433	4,387	11,360
13. South Pickering	1,425	790	613	2,828	7,920
14. Ajax	410	374	949	1,733	10,520
15. Oshawa-Whitby	3,745	2,251	579	6,575	26,840
16. Columbus	-2	711	1,935	2,644	8,760
17. Bowmanville	215	344	-73	486	4,120
18. Audley	11	269	909	1,189	11,600
North Sector	(2,060)	(898)	(1,787)	(4,745)	
19. Woodbridge	100	106	111	317	1,120
20. Markham	279	76	194	549	3,040
21. Richmond Hill	756	310	494	1,560	5,120
22. Newmarket-Aurora	925	406	988	2,319	5,040
23. Metro Toronto	14,802	4,757	508	20,067	154,149
24. Rest of COLUC	1,763	1,277	2,369	5,409	(2)
Total COLUC	34,950	24,170	21,059	80,179	(2)

(1) Total acreage includes all built-up and vacant land in each urban place.

(2) Not available.

Source: Tables E-7, E-8 and E-9 and COLUC Support Staff.

42 percent (14,800 acres) is expected to be needed in Metro Toronto. The urban places west of Metro Toronto are expected to need about 9,500 acres of new residential land compared to 6,800 acres in the places east of Metro Toronto and only 2,000 acres in the areas north of Metro Toronto.

Over the 1986-2001 and 2001-maturity periods the largest residential land requirements are anticipated in the urban places west of Metro Toronto (about 10,000-11,000 acres each period) followed by the places east of Metro Toronto (about 6,000-7,000 acres per period). Residential land requirements in Metro Toronto are projected to fall from about 4,800 acres in the 1986-2001 period to only 500 acres in the 2001-maturity period. Land requirements in the places north of Metro Toronto remain quite small.

For the entire 1971-maturity period, roughly 25 percent (20,000 acres) of total COLUC Area residential land requirements are projected to be needed in Metro Toronto. In declining order of magnitude the other urban places having significant residential land requirements over this period include Hamilton (6,713 acres), Oshawa-Whitby (6,575 acres), Mississauga (5,320 acres), Erin Mills (4,978 acres) and Brampton-Bramalea (3,784 acres).

It should be noted that for most urban places residential land requirements over the 1971-maturity period are substantially less than the total acreages within the urban places.

The reader is cautioned that these residential land requirements projections by urban place are the product of a technique involving

many assumptions. While these underlying assumptions represent our "best estimates" of probable future trends in such variables as average household size and housing mix by urban place, it is important that the projections be treated as rough approximations of probable residential land requirements by urban place.

CHAPTER 4

ALTERNATIVE PROJECTIONS OF HOUSING AND RESIDENTIAL LAND REQUIREMENTS*

Reviewers of our First Phase Report suggested several alternative scenarios which they believed should be considered in the study. The impact of these alternatives on residential land requirements are assessed in this chapter.

1. IMPACT OF ALTERNATIVES ON TOTAL RESIDENTIAL LAND REQUIREMENTS

A total of five alternatives to our "best estimate" projections of residential land requirements for the overall COLUC Area are considered. A brief description of each alternative together with estimates of their implications for total overall COLUC Area residential land requirements over the 1971-1986, 1986-2001, and 1971-2001 periods are presented in Table 3.

Under Alternatives A, B and E total residential land requirements do not vary materially from our "best estimate" projections. On the other hand, land requirements are about 84,000 acres and 30,000 acres higher, respectively, under Alternatives C and D than our "best estimate" projection over the entire 1971-2001 period.

Land requirements are substantially higher with Alternative

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*See Technical Appendix F for a complete discussion of these alternative projections.

Table 3: COMPARISON OF PROJECTIONS OF TOTAL RESIDENTIAL LAND REQUIREMENTS, COLUC AREA, 1971-2001

	Gross Residential Acres		
	1971-1986	1986-2001	1971-2001
Best Estimate	34,743	24,681	59,424
Alternative A	32,919	(1)	(1)
Alternative B	33,281	23,725	57,006
Alternative C	74,158	68,830	142,988
Alternative D	47,438	42,336	89,774
Alternative E	32,878	22,562	55,440

(1) Not available.

Summary of Alternatives

Alternative A: Same as "best estimate" except that projection of age distribution of the COLUC Area population in 1986 is based on a CMHC study.

Alternative B: Same as "best estimate" except that it is assumed non-family households will account for only 25 percent of the increase in total households over the 1971-1986 and 1986-2001 periods.

Alternative C: Same as "best estimate" except that it is assumed the average cost of family-type accommodation and average family income will both rise at the same rate over the 1971-1986 and 1986-2001 periods.

Alternative D: Same as Alternative C except that is is assumed relatively more of total family-type accommodation is of the medium density variety while relatively less is low density housing.

Alternative E: Same as "best estimate" except that it is assumed (a) a relatively greater proportion of housing requirements will be in the form of medium density housing and (b) densities (units per acre) are slightly higher.

C since a very large proportion of new housing requirements is assumed to be of the low density variety. Alternative D has a high proportion of medium density housing requirements.

2. IMPACT OF ALTERNATIVES ON RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE

As alternatives C and D are the only two alternatives considered which generate residential land requirements over the 1971-2001 period significantly different than our "best estimate" projections, detailed allocations of land requirements by urban place are made for these alternatives only.

The Alternative C projections of residential land requirements by urban place for the 1971-1986 and 1986-2001 periods are considered to be unrealistic given the population allocations provided us by the COLUC Support Staff. This results from the very large number of low density units which would have to be built in Metro Toronto (the Municipality of Metropolitan Toronto plus a northern fringe area). Our projections indicate that under Alternative C some 47,000 acres of residential land (which is not reasonable) would be required in Metro Toronto over the 1971-2001 period.

The alternative D residential land projections by urban place over the 1971-maturity period are compared with the "best estimate" projections in Table 4. Under Alternative D land requirements are now higher in each urban place.

Table 4: COMPARISON OF ALTERNATIVE D AND "BEST ESTIMATE" RESIDENTIAL LAND PROJECTIONS BY URBAN PLACE, COLUC AREA, 1971-MATURITY

	Alternative D	Best Estimate
West Sector	(52,377)	(30,116)
1. Hamilton	10,460	6,713
2. Burlington	3,707	1,908
3. North Burlington	2,083	1,192
4. Milton	436	246
5. Oakville	4,258	2,407
6. North Oakville	4,480	2,554
7. Mississauga	8,412	5,320
8. Erin Mills	9,855	4,978
9. Malton	867	425
10. Brampton-Bramalea	6,730	3,784
11. Georgetown	1,089	589
East Sector	(30,753)	(19,842)
12. North Pickering	6,295	4,387
13. South Pickering	3,869	2,828
14. Ajax	3,090	1,733
15. Oshawa-Whitby	9,925	6,575
16. Columbus	4,464	2,644
17. Bowmanville	1,077	486
18. Audley	2,033	1,189
North Sector	(8,490)	(4,745)
19. Woodbridge	598	317
20. Markham	964	549
21. Richmond Hill	2,816	1,560
22. Newmarket-Aurora	4,112	2,319
23. Metro Toronto	26,304	20,067
24. Rest of COLUC Area	9,799	5,409
Total COLUC Area	127,723	80,179

Source: Tables E-10 and F-12.

TECHNICAL APPENDIX A

HOUSEHOLD PROJECTIONS FOR THE COLUC AREA, 1986 AND 2001*

The general approach followed to project the number of households in the COLUC area in the years 1986 and 2001 includes the following steps:

(1) Projection of total population and its age composition;

(2) Projection of family and non-family household to population ratios by age grouping of population; and

(3) Projection of total family and non-family households by age of household head.

1. TOTAL POPULATION BY AGE GROUP, 1986 AND 2001

Projections of total population and the age composition of the population for the years 1986 and 2001 were provided by the COLUC Support Staff. The Support Staff in addition provided information on population growth in the COLUC Area over the 1941-1971 period (Table A-1).

According to these projections, total population of the COLUC Area is expected to increase from 3,325,000 persons in 1971

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*Given that the COLUC Area is not expected to attain a condition of maturity until some unspecified time beyond the year 2001, a detailed projection of total households at maturity was not attempted. However, as a basis for making some general observations about residential land requirements by urban place over the entire 1971-maturity period, a very crude projection of total households at maturity is made in Technical Appendix E.

Table A-1: POPULATION GROWTH, COLUC AREA, SELECTED PERIODS, 1941-2001

	Total Population 000's of Persons	Increase in Population 000's of Persons	Percent
1941	1,290		
		762	59.1
1956	2,052		
		1,273	62.0
1971	3,325		
		1,037	31.2
1986	4,362		
		1,285	29.4
2001	5,647		

Source: COLUC Support Staff.

Table A-2: COMPARISON OF ALTERNATIVE POPULATION PROJECTIONS, COLUC AND TORONTO-HAMILTON AREAS, SELECTED YEARS, 1971-2001(1)

	000's of Persons		
	COLUC Area	T.A.R.M.S. Area(2)	Toronto and Hamilton Census Metropolitan Areas(2)
1971	3,325	3,272	3,126
1981		4,068	3,958
1986	4,362		4,423
1991		4,905	
2001	5,647	5,653	

(1) Blank spaces indicate that data are not available for these years.
(2) Preliminary.

Sources: Table A-1; Metropolitan Toronto Planning Board Research Division; and Economics and Statistics Division, Central Mortgage and Housing Corporation.

to about 4,400,000 persons in 1986 and to about 5,700,000 persons in 2001.

In terms of growth rates, population growth in the COLUC Area is anticipated to slacken considerably over the next 30 years. Compared with an average growth rate of about 60 percent per 15 years during the 1941-1971 period, population growth is expected to be only about 30 percent per 15 years over the 1971-2001 period. In terms of persons, population growth is expected to decline to about 1,100,000 persons over the 1971-1986 period compared to about 1,300,000 persons over the 1956-1971 period; over the 1986-2001 period the increase in population is expected to rise to about 1,300,000 persons.

It is useful to compare the COLUC Support Staff population projections with two other recent population projections (Table A-2).* The Research Division of the Metropolitan Toronto Planning Board in preliminary projections released in January, 1974 projected total population for the T.A.R.M.S. Area (which is essentially the same as the COLUC Area) for the years 1981, 1991 and 2001. Similarly, the Economics and Statistics Division of Central Mortgage and Housing Corporation (CMHC) has prepared

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*This is a helpfull exercise since the technique for converting population into households used in this study is based upon data and projections contained in the CMHC study which projects population and households in 1986 for the Hamilton and Toronto Census Metropolitan Areas; moreover the Metropolitan Toronto Planning Board, based on its population projections, has made household projections for the year 2001.

preliminary population projections for the Toronto and Hamilton Census Metropolitan Areas (these two areas combined are smaller than the COLUC Area) for the years 1981 and 1986.

The Planning Board projection of total population for the T.A.R.M.S. Area for the year 2001 is virtually the same as the COLUC projection. In contrast, the CMHC projection for the combined Toronto and Hamilton Census Metropolitan Areas in 1986 is slightly higher than the COLUC figure although total population in 1971 was about 6 percent less.

The COLUC Support Staff projections indicate that the COLUC Area population will become "older" over both the 1971-1986 and 1986-2001 periods (Table A-3). Between 1971 and 1986 the proportion of the population in the "0-14" and "15-24" age groups is expected to decline while the proportion of the population is all other age groups with the exception of the "45-54" group will increase; between 1986 and 2001 the proportion of the population in the three age groups under 35 is expected to decline while the proportions for the other age groups will increase.

While the age composition of the population of the COLUC Area and the Toronto-Hamilton Census Metropolitan Areas are very similar in 1971, this is not the case for the COLUC and CMHC projections for 1986. The major difference is that the CMHC projection anticipates that a significantly greater share of the 1986 total population will be in the "25-34" age group. While

Table A-3: COMPARISON OF ALTERNATIVE AGE DISTRIBUTIONS OF POPULATION, COLUC AND TORONTO-HAMILTON AREAS, SELECTED YEARS, 1971-2001

	COLUC Area			Toronto + Hamilton Census Metropolitan Areas(1)	
	1971	1986	2001	1971	1986
			Percent		
0-14	27.4	23.1	19.2	27.2	21.2
15-24	17.6	15.3	14.4	17.6	16.5
25-34	14.8	16.8	14.9	15.0	21.6
35-44	13.3	15.6	16.2	13.4	15.4
45-54	11.3	10.9	14.3	11.4	9.4
55-64	7.9	9.4	10.0	7.9	8.2
65 and over	7.7	8.9	11.0	7.6	7.6
Total	100.0	100.0	100.0	100.0	100.0
			000's of Persons		
0-14	911	1,008	1,084	849	936
15-24	585	667	813	551	728
25-34	492	733	841	468	957
35-44	442	681	915	418	684
45-54	376	475	808	355	418
55-64	263	410	565	246	362
65 and over	256	388	621	239	339
Total	3,325	4,362	5,647	3,126	4,423

(1) Preliminary.

Sources: COLUC Support Staff and Economics and Statistics Division, Central Mortgage and Housing Corporation.

it is beyond our scope to probe reasons for these differences in the expected age distribution of the population in 1986, the COLUC Task Force may wish to review this matter. The age composition of the population is an important factor underlying household formation and housing requirements by type.

2. HOUSEHOLD/POPULATION RATIOS BY AGE GROUP

The Economics and Statistics Division of CMHC has prepared preliminary projections of total family and non-family households in 1986 for the Toronto and Hamilton Census Metropolitan Areas. These projections form the basis for the 1986 household projections used in our study; the 2001 projections are derived by the consultant primarily from information presented in the CMHC study.

From the CMHC study household/population ratios were calculated for family and non-family households separately for 6 age groupings for the years 1956, 1971 and 1986 for Ontario and the years 1971 and 1986 for the combined Hamilton and Toronto Census Metropolitan Areas (Table A-4). Data for Ontario are included since census boundary changes mean that a trend could not be established over the 1956-1971 period for the Hamilton-Toronto Census Metropolitan Areas.

In Ontario over the 1956-1971 period, and probably in

Table A-4: RATIO OF HOUSEHOLDS TO POPULATION BY AGE GROUP, ONTARIO AND COMBINED TORONTO AND HAMILTON CENSUS METROPOLITAN AREAS, SELECTED YEARS, 1956-2001

	Ontario			Hamilton and Toronto CMAs		
	Ratio of Households by Age of Head to Population in Each Age Group			Ratio of Households by Age of Head to Population in Each Age Group		
	1956	1971	1986(1)	1971	1986(1)	2001
Non-Family Households						
15-24	.007	.031	.075	.039	.088	.130
25-34	.015	.052	.118	.069	.168	.168
35-44	.023	.039	.053	.048	.080	.080
45-54	.050	.059	.063	.064	.079	.080
55-64	.099	.124	.142	.124	.156	.160
65+	.178	.254	.333	.248	.339	.370
	.050	.077		.082		
Family Households						
15-24	.059	.078	.091	.073	.071	.071
25-34	.322	.390	.458	.365	.422	.422
35-44	.414	.462	.504	.457	.489	.490
45-54	.434	.456	.470	.456	.488	.490
55-64	.412	.431	.447	.420	.476	.480
65+	.337	.312	.290	.287	.283	.260
	.320	.329		.323		
Total Households						
15-24	.066	.108	.166	.112	.159	
25-34	.337	.442	.575	.434	.590	
35-44	.437	.501	.557	.505	.569	
45-54	.484	.516	.533	.520	.567	
55-64	.512	.555	.590	.545	.632	
65+	.515	.566	.623	.535	.622	
	.370	.407		.405		

(1) Preliminary.

Source: John S. Kirkland, Demand for Housing in Canada (Ottawa: CMHC, 1973) and estimates by consultant.

the COLUC Area as well, the ratios of households to population increased for both family and non-family households and for most age groups. The sharpest increases occurred in the non-family household/population ratios, particularly for the "15-24" and "25-34" age groups.

Over the 1971-1986 period the CMHC study indicates that non-family households/population ratios will continue to rise sharply especially in the age groups below the age of 45 and the "65 and over"age group. Generally, only moderate changes are expected to occur in the family household/population ratios.

For the year 2001 it is assumed that the household/population ratios with three exceptions will remain at their 1986 levels. The exceptions are that the non-family household/population ratios for the "15-24" and "65 and over" age groups are assumed to be higher than in 1986 while the family household/population ratio for the "65 and over" age group is assumed to be slightly lower. The other ratios are held constant since if allowance is made for the fact that most family households have two adults of about the same age, virtually all adults in 1986 would be the head of a family or non-family household or the spouse of a family head.

3. HOUSEHOLDS BY AGE GROUP, 1986 AND 2001

Total non-family and family households by age of household

head in the years 1986 and 2001 are calculated by multiplying the projected population in each age group (Table A-3) by the household/population ratios (Table A-4).

Total households in the COLUC Area are expected to increase from approximately 985,000 in 1971 to about 1,700,000 and 2,400,000 households in 1986 and 2001 respectively (Table A-5).

The growing relative importance of non-family households which has characterized the postwar period throughout the country is expected to continue in the COLUC Area over the 1971-2001 period (Table A-6). Non-family households as a proportion of total households in the COLUC Area are projected to increase from an estimated 20 percent in 1971 to nearly 28 percent in 1986 and to about 29 percent in 2001.

If the CMHC age distribution of the 1986 population for the Toronto-Hamilton Census Metropolitan Areas is applied to the COLUC Support Staff projection of 1986 COLUC Area population, the 1986 projection of total households is only about 1 percent higher than the projection derived here. However, the composition of households by age of head according to the two projections vary significantly; the major impact of the CMHC distribution of the population in 1986 therefore is on the type of housing required rather than on total housing requirements.

It should be noted that the distribution of total households between family and non-family households in 1971 which is used as the base for the 1986 and 2001 household projections differs

Table A-5: ESTIMATED TOTAL FAMILY AND NON-FAMILY HOUSEHOLDS, COLUC AREA, SELECTED YEARS, 1971-2001

	Number of Households		
	1971	1986	2001
Non-Family Households			
15-24	22,949	58,730	105,712
25-34	34,309	123,113	141,356
35-44	21,388	54,438	73,185
45-54	24,228	37,561	64,602
55-64	32,653	63,964	90,352
65 and over	63,843	131,606	229,833
	199,370	469,412	705,040
Family Households			
15-24	42,955	47,384	57,735
25-34	181,489	309,248	355,072
35-44	203,632	332,751	448,259
45-54	172,626	232,024	395,685
55-64	110,599	195,173	271,056
65 and over	73,882	109,866	161,504
	785,183	1,226,446	1,689,311
Total Households			
15-24	65,904	106,114	163,447
25-34	215,798	432,361	496,428
35-44	225,020	387,189	521,444
45-54	196,854	269,585	460,287
55-64	143,515	259,138	361,408
65 and over	137,725	241,472	391,337
	984,816	1,695,859	2,394,351

Source: Tables A-3 and A-4.

Table A-6: HOUSEHOLDS BY TYPE AND AVERAGE SIZE, COLUC AREA, SELECTED YEARS, 1961-2001

	Households by Type			Average Persons Per Household
	Family	Non-Family	Total	
	Percent			
1961	87.1	12.9	100.0	3.8
1971	81.1	18.9	100.0	3.4
1971(1)	79.7	20.3	100.0	3.4
1986	72.3	27.7	100.0	2.6
2001	70.6	29.4	100.0	2.4

(1) This breakdown is an estimate based upon applying the 1971 household/population ratios for the Toronto-Hamilton Census Metropolitan Areas to the COLUC Area 1971 population.

Source: Statistics Canada, Census of Canada, 1961 and 1971 and Tables A-1 and A-5.

slightly from the actual distribution of family and non-family households in the COLUC Area in 1971. Applying the household/population ratios by age of household head for the Toronto-Hamilton Census Metropolitan Areas to the 1971 COLUC Area population slightly overstates the number of non-family households in the Area.

Comparison of the preliminary 2001 household projections of the Metropolitan Toronto Planning Board with the projections derived here shows that the projections of family households are very similar (the projections here are about 5 percent higher). For non-family households our projections are sharply higher -- by almost 40 percent. Hence, our projection of total households in 2001 is some 13 percent above the Planning Board projections.*

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*Reliable projections of the growth in non-family households are notoriously difficult to make. In the recent past most studies have tended to understate increases in non-family households. For instance, as recently as early 1972 Central Mortgage and Housing Corporation continued to project that annual net non-family household formation over the 1966-1971 period in Canada averaged 50,000 households. When 1971 Census data became available, it was found that the increase in non-family households averaged 60,800 per year over this period; thus CMHC underestimated the growth in non-family households by about 20 percent. See Canadian Housing Statistics 1971, Table 119 and Canadian Housing Statistics 1972, Table 116.

TECHNICAL APPENDIX B

ANALYSIS OF TRENDS IN HOUSING STARTS BY TYPE IN THE COLUC AREA

The purpose of this analysis is to identify and try to explain trends in the composition of housing starts in the COLUC Area over the last 15 or so years. Interest is especially centred on two phenomena: (a) that over most, if not all, of the postwar period apartments accounted for a much higher share of total housing starts in the COLUC Area than in many other parts of the country; and (b) that the COLUC Area in the late 1950's and the decade of the 1960's in common with other larger urban areas in Canada experienced a pronounced shift to apartments in the mix of new housing starts.

The results of this analysis are then used as a basis for translating the household projections derived in Technical Appendix A into housing requirements by type (see Technical Appendix D).

A type of comparative analysis is used to examine trends in the composition of housing starts in the COLUC Area. Trends in the COLUC Area are compared with those in three other larger urban areas (the Calgary, Kitchener and Winnipeg Census Metropolitan Areas) and Ontario and Canada. These three urban areas were chosen since their census boundaries did not

change between 1961 and 1971 and they encompass areas having both rapidly growing and slow growing populations.

Two approximations of the COLUC Area are used in the analysis. Approximation 1 consists of the 6 counties within the COLUC Area -- Durham, Halton, Ontario, Peel, Wentworth and York. Since the boundaries of this 6 county area are esentially the same as those of the COLUC Area and the boundaries of these counties have remained more or less the same over the last several years, data for Approximation 1 best portrays trends in the COLUC Area. Unfortunately only rudimentary census housing data are published on a county basis. For much of the analysis it has been necessary to examine data for the combined Toronto and Hamilton Census Metropolitan Areas and the Oshawa Census Agglomeration (Approximation 2). These data are less satisfactory since the area boundaries were revised in the 1971 Census; however they have the advantage of being more comprehensive than the county data. Where data are available for both approximations of the COLUC Area they are included in the statistical tables in order to indicate the nature of biases introduced by using Approximation 2.

1. HOUSING STARTS AND HOUSING STOCK TRENDS

An examination of trends in housing starts by type over the past two decades in the COLUC Area reveals several interesting

features (Table B-1).* Firstly, apartments have been a prominent component of total housing starts as far back as the early 1950's accounting for about one-third of total starts at that time. Secondly, during the late 1950's and the decade of the 1960's apartment starts as a proportion of total housing starts moved sharply upward. This was part of a nation-wide trend. Thirdly, apartment starts as a proportion of total starts declined sharply during the early years of the 1970's. Again, this relative decline in apartment starts appears to be a nation-wide phenomenon. Lastly, semi-detached, duplex and row dwelling units in the early 1970's accounted for a significantly greater share of total housing starts in the COLUC Area than in the earlier periods.

Compared with the other areas surveyed, the COLUC Area over the entire 1961-1973 period has had relatively fewer single-detached house starts and relatively more semi-detached, duplex, row and apartment starts (Table B-2). If starts of family-type accommodation are approximated by dwelling starts other than apartment starts, over this period the COLUC Area has produced relatively fewer family-type units than the other

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*There are no readily available comprehensive data on past trends in total housing starts in the COLUC Area. CMHC starts data do not cover rural or smaller urban areas outside the Toronto and Hamilton Census Metropolitan Areas and Oshawa Census Agglomeration. This gap in addition to understating total starts by an unknown amount probably overstates the proportion of total starts for the Area which are apartments.

Table B-1: HOUSING STARTS BY TYPE, COLUC AREA,[1] SELECTED PERIODS, 1952-1973

	Percent						
	Single-Detached	Semi-Detached and Duplex	Row	Apartment	Total	Apartments as a Percent of Total Starts	
						Ontario	Canada
1952-55	64.9	3.4	--	31.7	100.0	(2)	21.7
1956-60	48.3	7.0	0.9	44.1	100.0	25.8	25.0
1961-65	32.3	7.6	4.6	55.7	100.0	42.9	39.3
1966-70	22.5	6.8	7.0	63.7	100.0	48.7	48.2
1971-73	24.8	11.2	10.6	53.5	100.0	46.0	42.1

(1) Approximation 2. See text for definitions of Approximations 1 and 2.
(2) Not readily available.

Source: Central Mortgage and Housing Corporation.

Table B-2: HOUSING STARTS BY TYPE, COLUC AND OTHER AREAS, SELECTED PERIODS 1961-1973

Percent

	Single-Detached				Semi-Detached and Duplex				Row			
	1961-65	1966-70	1971-73	1961-73	1961-65	1966-70	1971-73	1961-73	1961-65	1966-70	1971-73	1961-73
COLUC AREA												
Approximation 2	32.3	22.5	24.8	26.2	7.6	6.8	11.2	8.3	4.6	7.0	10.6	7.3
Calgary	57.8	40.9	54.7	49.9	7.0	8.1	6.1	7.2	0.7	4.9	7.3	4.4
Kitchener	45.3	36.6	32.8	37.6	3.3	7.4	9.1	6.9	1.1	9.5	11.3	7.8
Winnipeg	51.9	30.4	33.3	37.3	5.1	6.2	7.0	6.2	3.2	6.3	4.2	4.7
Ontario	46.7	37.5	36.8	40.0	6.5	5.9	7.8	6.7	3.9	7.9	9.4	7.2
Canada	51.7	41.0	45.9	45.8	6.4	5.4	5.4	5.7	2.7	5.4	6.6	4.9

	Single-Detached, Semi-Detached and Duplex and Row				Apartments				Total			
	1961-65	1966-70	1971-73	1961-73	1961-65	1966-70	1971-73	1961-73	1961-65	1966-70	1971-73	1961-73
COLUC Area												
Approximation 2	44.5	36.3	46.6	41.8	55.7	63.7	53.5	58.2	100.0	100.0	100.0	100.0
Calgary	65.5	53.9	68.1	61.5	34.5	46.1	31.9	38.5	100.0	100.0	100.0	100.0
Kitchener	49.7	53.5	53.2	52.3	50.3	46.5	46.8	47.6	100.0	100.0	100.0	100.0
Winnipeg	60.2	42.9	44.5	48.2	39.8	57.2	55.8	51.9	100.0	100.0	100.0	100.0
Ontario	57.1	51.3	54.0	53.9	42.9	48.7	46.0	46.1	100.0	100.0	100.0	100.0
Canada	60.8	51.8	57.9	56.4	39.3	48.2	42.1	43.5	100.0	100.0	100.0	100.0

Source: Central Mortgage and Housing Corporation.

areas.*

As a consequence of the shift in the composition of housing starts over the past several years, in all areas surveyed the proportion of single-detached houses in the total occupied housing stock declined between 1961 and 1971 (Table B-3).**

2. INCREASED ROLE OF NON-FAMILY HOUSEHOLDS

A major cause of the relative shift to apartments in both the COLUC Area and elsewhere during the 1960's has been the rapid growth in non-family households. While the proportion of households which were non-family households increased slightly over the 1950's, it was not until the 1960's, especially the last half of the decade, that a very rapid increase in the number of non-family households took place. As non-family households are more likely to occupy apartment accommodation, this shift to non-family households produced a corresponding shift in the proportion of new housing starts which were apartments.

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*In the COLUC Area, in recent years at least, very few apartment starts have been of the low-rise variety which are often considered to be suitable family type accommodation. For instance, in the Hamilton - Toronto Census Metropolitan Areas over the last 4 years 87 percent of all apartment starts were in structures of more than 100 units.

**Statistics Canada staff indicate that the only reliable breakdown of occupied housing by type of structure from the 1971 Census is between single-detached dwellings and "other". Apparently many respondents on this first self-enumeration census erred in answering the question related to type of housing occupied. One common error apparently was for apartment residents to reply that they lived in a single-attached dwelling.

Table B-3: SINGLE-DETACHED DWELLINGS AS A PROPORTION OF TOTAL OCCUPIED DWELLINGS, COLUC AND OTHER AREAS, SELECTED PERIODS, 1961-1971

Percent

	Single-Detached Dwellings as a Percent of Total Occupied Dwellings			Increase in Single-Detached Dwellings as a Percent of Increase in Total Occupied Dwellings		
	1961	1966	1971	1961-66	1966-71	1961-71
COLUC Area						
Approximation 1	61.3	56.0	50.4	30.7	26.3	28.2
Approximation 2	59.7	54.2	48.7	29.7	31.2	30.6
Calgary	64.8	63.6	60.3	58.1	48.2	52.0
Kitchener	70.4	63.9	58.1	38.6	35.5	36.9
Winnipeg	70.3	67.6	63.4	44.6	36.9	39.9
Ontario	69.5	65.7	61.4	39.1	38.0	38.5
Canada	65.4	62.4	59.5	40.8	41.9	41.4

Source: Statistics Canada, Census of Canada.

In the COLUC Area non-family households accounted for over 36 percent of the increase in total households in the last half of the 1960's compared with only 17 percent in the 1950's (Table B-4). Similar increases in the importance of non-family households took place in the other areas.

While the relative growth of non-family households undoubtedly has been an important factor behind the shift in the composition of housing starts to apartments, it is by no means the only factor. To illustrate, in the last half of the 1960's apartments accounted for 64 percent of new housing starts in the COLUC Area yet only 36 percent of the increase in total households were non-family households. Clearly, many families in the COLUC Area reside in apartments -- the extent to which this may be a matter of choice or of economic necessity is considered later in the analysis.

3. TREND TOWARD FAMILIES LIVING IN APARTMENTS*

Two alternative indicators are employed in an effort to

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*The analysis here is directed at discovering the types of housing and trends therein occupied by family and non-family households by age of household head. As census data are available for dwelling type cross-classified by age of head for all households only (i.e., not for family and non-family households separately) a comprehensive analysis was not possible.

What is done here is to relate various available measures of family-type accommodation to total family households and family households by age of head. Implicitly then it is assumed that non-family households do not occupy family-type accommodation; however, many non-family households, particularly the elderly do reside in single-detached houses so this assumption is not entirely correct.

Table B-4: HOUSEHOLDS BY TYPE, COLUC AND OTHER AREAS, SELECTED YEARS, 1951-1971

Percent

	Non-Family Households as a Percent of Total Households				Increase in Non-Family Households as a Percent of Increase in Total Households			
	1951	1961	1966	1971	1951-61	1961-66	1966-71	1961-71
COLUC Area								
Approximation 1	(1)	12.9	15.0	18.9	(1)	24.9	35.7	31.1
Approximation 2	10.0	12.9	15.1	19.0	17.3	25.2	33.1	30.0
Calgary	15.9	16.6	19.4	21.1	17.3	29.0	28.7	28.8
Kitchener	(1)	12.4	14.3	16.6	(1)	21.6	25.9	24.0
Winnipeg	9.8	13.8	17.3	21.8	25.4	47.5	50.2	49.1
Ontario	11.3	13.3	15.2	18.1	18.3	28.9	33.3	31.5
Canada	11.3	13.3	15.5	18.3	19.3	31.7	35.3	33.8

(1) Not readily available.

Source: Statistics Canada, Census of Canada.

identify the overall relationship between increases in the stock of family type accommodation and increases in the number of family households in the COLUC and other areas.

Table B-5 shows that whether family-type housing is approximated by only single-detached houses or whether semi-detached, duplex, and row units are also considered, the production of new family-type housing in the COLUC Area over the 1960's lagged far behind the increase in family households compared with the other areas surveyed. The ratio of single-detached, semi-detached, duplex, and row starts to the increase in family households in the COLUC Area was only 57 percent compared to 86 percent for Ontario and 120 percent for Winnipeg. What this means is that over the 1960's the COLUC Area produced only 57 new housing units of these types for every 100 increase in family households compared to 86 units for Ontario and 120 for Winnipeg.

Census data relating the increase in the stock of occupied single-detached dwellings to the increase in family households point to a similar conclusion -- that the COLUC Area over the 1960's produced fewer additional houses per 100 increase in family households than the other selected areas (Table B-6).

Turning to the relationship between the stock of family-type housing and number of family households by age of household head in 1971, in both the COLUC Area and the other areas the ratios increase rapidly up to the "35-44" age group; the ratios also increased but at a slower rate up to the "65 and over" age

Table B-5: SINGLE-DETACHED, SEMI-DETACHED AND DUPLEX AND ROW STARTS AND FAMILY HOUSEHOLDS, COLUC AREA AND SELECTED OTHER AREAS, 1961-1971

Percent

	Selected Types of Housing Starts as a Percent of Increase in Family Households		
	Single-Detached	Semi-Detached, Duplex and Single-Detached	Single-Detached, Semi-Detached, Duplex and Row
COLUC Area Approximation 2	38.0	48.2	56.7
Calgary	82.3	95.5	99.0
Kitchener	59.1	67.5	76.3
Winnipeg	94.2	107.7	119.7
Ontario	66.0	75.9	85.7
Canada	76.0	85.7	92.6

Source: Statistics Canada, Census of Canada and Central Mortgage and Housing Corporation.

Table B-6: SINGLE-DETACHED DWELLINGS AND FAMILY HOUSEHOLDS, COLUC AND OTHER AREAS, SELECTED YEARS 1961-1971

Percent

	Single-Detached Dwellings as a Percent of Family Households			Increase in Single-Detached Dwellings as a Percent of Increase in Family Households		
	1961	1966	1971	1961-66	1966-71	1961-71
COLUC Area						
Approximation 1	70.4	65.8	62.1	40.9	40.8	40.8
Approximation 2	68.5	63.8	60.8	38.9	47.2	43.7
Calgary	77.7	78.9	76.3	86.0	65.9	73.3
Kitchener	80.3	74.5	69.7	49.2	47.8	48.5
Winnipeg	81.6	81.8	81.0	84.9	73.4	78.1
Ontario	80.2	77.5	74.8	55.1	56.6	55.9
Canada	75.4	73.9	72.8	59.8	64.2	62.3

Source: Statistics Canada, Census of Canada.

group (Tables B-7 and B-8)*

In virtually every instance, the ratios in each age group are lower for the COLUC Area then for the other selected areas. This would seem to suggest that the explanation for the relatively low quantity of new family-type housing accommodation constructed in the COLUC Area may be attributable to some pervasive influence such as a relatively higher housing cost structure.

Tables B-9 and B-10 examine changes in the ratios of family-type accommodation to family households between the years 1961 and 1971 in the COLUC Area and other selected areas.** It appears that the proportion of families living in family-type accommodation declined in all the areas surveyed. The decline was largest for the COLUC Area and Kitchener.

In all areas substantial declines took place in the family-type housing/family households ratios in the "Under 25" age group. It should be recalled though that relatively few families in this age group in the past have lived in family-type

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*While it would have been preferable to approximate family-type accommodation by combining single-detached and single-attached dwellings this was not done in light of Statistics Canada concern about the reliability of single-attached dwelling data. Instead family-type accommodation is approximated by two alternative series -- single-detached dwellings and owner-occupied dwellings.

**For both 1961 and 1971 the ratio of total single-detached or owner-occupied dwellings occupied by all households in each age group to the number of family households in the age group is calculated. The percentage change in these ratios is what is shown in Tables B-9 and B-10.

Table B-7: OCCUPIED SINGLE-DETACHED DWELLINGS AND FAMILY HOUSEHOLDS BY AGE OF HOUSEHOLD HEAD, COLUC AND OTHER AREAS, 1971

Percent

	Single-Detached Dwellings as a Percent of Family Households						
	Age of Family Household Head						
	Under 25	25-34	35-44	45-54	55-64	65 and over	Total
COLUC Area							
Approximation 2	18.0	39.6	62.2	70.4	73.2	86.0	60.2
Calgary	29.3	57.4	83.2	88.1	93.0	110.1	76.3
Kitchener	16.6	47.3	75.1	83.1	88.3	108.8	69.7
Winnipeg	31.4	60.9	84.2	90.0	94.6	105.9	81.0
Ontario	29.7	53.9	73.6	81.3	88.3	112.5	74.8
Canada	34.8	53.5	72.0	78.3	84.3	105.2	72.8

Source: Statistics Canada, Census of Canada.

Table B-8: OWNER-OCCUPIED DWELLINGS AND FAMILY HOUSEHOLDS BY AGE OF HOUSEHOLD HEAD, COLUC AREA AND SELECTED OTHER AREAS, 1971

Percent

	Owner-Occupied Dwellings as a Percent of Family Households						
	Age of Family Household Head						
	Under 25	25-34	35-44	45-54	55-64	65 and over	Total
COLUC Area Approximation 2	11.1	44.0	73.1	80.8	85.5	106.0	69.6
Calgary	12.9	48.4	78.2	86.1	96.4	118.4	71.9
Kitchener	11.4	47.4	76.9	85.3	94.1	118.8	71.9
Winnipeg	15.0	50.2	77.5	86.9	94.1	107.1	75.5
Ontario	17.0	50.4	76.2	85.2	94.4	122.2	76.7
Canada	20.3	48.3	72.9	82.1	90.7	113.5	73.7

Source: Statistics Canada, Census of Canada.

Table B-9: OCCUPIED SINGLE-DETACHED DWELLINGS AND FAMILY HOUSEHOLDS BY AGE OF HOUSEHOLD HEAD, COLUC AND OTHER AREAS, 1961-1971

Percent

	Percent Change in Ratio of Single-Detached Dwellings to Family Households, 1961-1971						
	Under 25	25-34	35-44	45-54	55-64	65 and over	Total
COLUC Area Approximation 2	-30.0	-28.1	-10.2	-3.3	-1.4	5.4	-11.1
Calgary	-27.5	-13.6	2.5	5.4	11.5	13.9	- 1.8
Kitchener	-42.4	-28.2	- 5.4	-3.2	-5.7	2.4	-13.2
Winnipeg	-15.6	-12.5	0.4	4.3	7.9	12.5	- 0.7
Ontario	-29.1	-17.6	- 5.4	-1.9	-1.2	4.6	- 6.7
Canada	-24.5	-12.6	- 1.6	1.3	1.6	3.8	- 3.4

Source: Statistics Canada, Census of Canada.

Table B-10: OWNER-OCCUPIED DWELLINGS AND FAMILY HOUSEHOLDS BY AGE OF HOUSEHOLD HEAD, COLUC AND OTHER AREAS, 1961-1971

Percent

	Percent Change in Ratio of Owner-Occupied Dwellings to Family Households, 1961-1971						
	Under 25	25-34	35-44	45-54	55-64	65 and over	Total
COLUC Area							
Approximation 2	-44.5	-25.3	-5.4	-4.5	-7.5	-3.2	-11.7
Calgary	-51.9	-15.7	3.4	1.6	0.4	0.2	- 5.3
Kitchener	-48.9	-25.2	-1.9	-3.1	-8.0	-1.3	-12.8
Winnipeg	-31.2	-13.4	-0.6	3.2	3.9	9.6	- 2.4
Ontario	-35.4	-14.0	-0.2	-0.8	-3.7	0.6	- 5.7
Canada	-30.2	- 9.4	1.8	1.2	-1.2	1.1	- 3.2

Source: Statistics Canada, Census of Canada.

accommodation.

More significantly, the ratios in the "25-34" age group, traditionally regarded as the prime home-buying age group, also declined sharply in all areas during the 1960's. The COLUC Area and Kitchener experienced the largest declines.

In the "35-44" age group declines were recorded for most areas. The decline was largest in the COLUC Area.

In the "45-54" and "55-64" age groups the COLUC Area, Kitchener and Ontario recorded declines. For the "65 and over" age group the ratios increased for most areas, reflecting the fact that many elderly non-family households reside in family-type accommodation.

In summary, over the 1960's it appears that a general decline took place in the proportion of younger families residing in family-type accommodation. Declines in the important "25-34" home-buying age group were largest in the COLUC Area and Kitchener. Declines also occurred in the age groups between the ages of 35 and 64 in the COLUC Area, Kitchener and Ontario, while the other areas experienced modest increases in some, if not all, of these age groups.

4. TRENDS IN HOUSING COSTS AND INCOMES

An important consideration in assessing the mix of new

housing starts is the relationship of housing costs to income.*

Table B-11 indicates that the rent/family income ratios in 1971 were fairly similar in the areas surveyed. While the ratio was highest for the COLUC Area, it was only about 7 percent above the national average. In contrast, marked differences between areas characterized the house value/family income ratio. This ratio for the COLUC Area in 1971 was considerably above the other areas. Kitchener and Ontario ranked second to the COLUC Area as areas in which house values were high relative to incomes.

Table B-12 contains data on increases in homeownership costs,** rents and family incomes between the years 1961 and 1971 for the survey areas. In all areas, estimated carrying charges associated with the median value house outpaced increases in average gross rent over the period; i.e., the cost of home-ownership housing became more expensive compared to rental housing.

Increases took place in the ratio of estimated carrying

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*The importance of centering attention on the relationship of housing costs to family income is illustrated in Table B-11. While median house value and rent in 1971 were substantially higher in the COLUC Area than in the other areas surveyed, average family income in the COLUC Area was also considerably higher.

**Two series of home-ownership costs are considered: (a) the increase in median house value and (b) the increase in estimated carrying charges (mortgage interest and principal and property taxes) associated with the median value house in 1961 and 1971. As mortgage interest rates increased over the 1961-1971 period, the increase in (b) is larger than the increase in (a).

Table B-11: HOUSING COSTS AND INCOME, COLUC AND OTHER AREAS, 1971

	Average Census Family Income 1970	Median Value of Single-Detached House 1971	Median Annual Gross Rent 1971	Ratio of Median Housing Costs to Average Family Income	
				House Value	Gross Rent
	Dollars			Percent	
COLUC Area					
Approximation 1	(1)	30,364	1,807	(1)	(1)
Approximation 2	11,619	30,634	1,819	2.64	0.16
Calgary	10,943	22,461	1,632	2.05	0.15
Kitchener	10,661	23,968	1,548	2.25	0.14
Winnipeg	9,989	17,780	1,356	1.78	0.14
Ontario	10,661	23,768	1,632	2.23	0.15
Canada	9,600	19,020	1,404	1.98	0.15

(1) Not readily available.

Source: Statistics Canada, Census of Canada.

Table B-12: HOUSING COSTS AND INCOME, COLUC AND OTHER AREAS, 1961-1971

	Increase in Median Value of Single-Detached House 1961-1971(1)	Increase in Average Annual Gross Rent 1961-1971	Increase in Average Census Family Income 1961-1970	Ratio of Increase in Median House Value to Increase in Average Gross Rent(1)	Ratio of Increa in Housing Cos to Increase i Average Censu Family Incom	
	Percent				Median House Value(1)	Avera Gross Rent
COLUC Area						
Approximation 2	86.2(121.2)	45.8	80.6	1.88(2.65)	1.07(1.50)	0.57
Calgary	51.2(78.8)	60.0	72.3	0.85(1.31)	0.71(1.09)	0.83
Kitchener	93.4(130.0)	80.3	80.4	1.16(1.62)	1.16(1.62)	1.00
Winnipeg	36.8(61.8)	46.8	70.0	0.79(1.32)	0.52(.88)	0.67
Ontario	83.5(117.4)	57.5	81.7	1.45(2.04)	1.02(1.44)	0.71
Canada	72.6(104.1)	55.8	76.2	1.30(1.87)	0.95(1.37)	0.7

(1) The figures included in brackets relate to the estimated carrying charges (mortgage interest and principal and property taxes) associated with the median value house.

Source: Statistics Canada, Census of Canada.

charges associated with the median value house to family income over the 1961-1971 decade in all areas except Winnipeg. Increases were greatest in Kitchener, the COLUC Area, Ontario and Canada. In the COLUC Area the increase in carrying charges associated with the median value house was 50 percent more than the increase in family incomes.

The rise in the homeownership cost to family income ratio resulted in fewer families being able to afford to purchase a median value house in 1971 compared to 1961 in the areas surveyed except for Calgary and Winnipeg (Table B-13). In the COLUC Area about 63 percent of families could not afford to purchase a median value house in 1971 compared to about 52 percent in 1961.

5. FACTORS UNDERLYING TRENDS IN THE COMPOSITION OF HOUSING STARTS IN THE COLUC AREA

A number of trends in the composition of housing starts in the COLUC Area over the past decade or so have been identified. These include:

(a) Compared with selected other areas the share of total housing starts accounted for by apartments has been consistently much greater in the COLUC Area;

(b) A marked switch to a relatively larger number of

Table B-13: ESTIMATED PROPORTION OF FAMILIES UNABLE TO AFFORD MEDIAN VALUE HOUSE, COLUC AND OTHER AREAS, 1961-1971(1)

	Percent		
	1961	1971	Percent Change 1961-1971
COLUC Area			
Approximation 2	51.5	63.1	22.5
Calgary	52.6	46.3	-12.0
Kitchener	30.5	49.8	63.3
Winnipeg	41.7	35.2	-15.6
Ontario	40.2	51.6	28.4
Canada	36.7	45.0	22.6

(1) These estimates are based on the premise that families which would have to spend more than 30 percent of their income for carrying charges in order to purchase the median value house cannot afford to purchase a home.

Source: Statistics Canada, Census of Canada.

apartment starts in the late 1950's and throughout the 1960's;

(c) A relative swing away from apartment starts in the early 1970's; and

(d) A sharp upswing in the proportion of total starts in the early 1970's in the form of semi-detached, duplex and row dwellings.

The relatively large proportion of apartment starts over the entire period as well as the upsurge in semi-detached, duplex and row starts in the early 1970's are trends which appear to be rather unique to the COLUC Area. In contrast, the trends toward increased apartment construction during the 1960's and away from apartment construction in the initial years of the 1970's appear to have happened in most housing markets across the country.

The fact that the COLUC Area has consistently produced a larger proportion of its new housing in the form of apartments over the past couple of decades could be the result of several forces including: (a) a relatively larger proportion of non-family households which in turn tend to prefer apartment accommodation; (b) relatively higher costs for family-type accommodation compared to apartments; (c) relatively higher costs of family-type accommodation compared to family incomes; and (d) a less strong preference by families for traditional family-type accommodation.

It does not appear that the COLUC Area has a disproportionately large number of non-family households compared with other areas. Moreover, while families in the COLUC Area may be more inclined to live in apartment accommodation, it is unlikely that family preferences are a major reason why the Area has built relatively more apartments. The dominant forces appear to be the relatively high cost of single-detached houses compared with average family income and, in recent years at least, the sharp rise in the carrying costs associated with the purchase of a house compared with rents in the COLUC Area.

The widespread swing toward apartment starts in the late 1950's and through the 1960's in part reflected the rapid growth in non-family households over the period. In all areas surveyed non-family households increased much more rapidly than family households over this period. In addition, it also appears that an increasing share of families in the 1960's deliberately chose to live in apartments. Younger married couples in particular, a rapidly growing segment of the population in the 1960's, generally preferred, at least initially, to live in apartments. The sharp declines in the ratios of family-type accommodation to family households in the younger age groups between 1961 and 1971, even in areas such as Calgary and Winnipeg where increases in home-ownership costs did not significantly outpace increases in family incomes, support this position.

In some areas such as the COLUC Area and Kitchener however, it is probably the case that many families who preferred to live in family-type accommodation and, in other areas who could probably afford to do so, could not afford to purchase a home in the 1960's. The sharper declines in the ratios of family-type accommodation to family households in the younger age groups and the declines in the other age groups up to the "65 and over" group between 1961 and 1971 in these areas are probably the result of an increasing home-ownership cost/income squeeze.

The switch in the composition of new housing starts away from apartments in the early 1970's reflects a resurgence of demand by families for family-type accommodation. While newly-formed families in the 1960's tended initially to prefer apartment accommodation, these families now apparently desire to own their own home. In many parts of the country families are able to afford single-detached houses. But in the COLUC Area the high price of single-detached houses (compared with incomes) in the early 1970's has meant that many families have had to substitute semi-detached and row housing for the single-detached house. Hence, the production of these forms of housing in the COLUC Area increased rapidly in recent years.

6. CONCLUSION

In spite of generally higher levels of family income in

the COLUC Area, it appears that over the past decade or two many families who would prefer to live in family-type accommodation, and who could do so in many other parts of the country, have had to occupy apartments. In recent years almost all new apartment construction in the COLUC Area has been of the high rise variety which many observers do not regard to be a suitable form of family housing.

The trend toward increased apartment construction in the COLUC Area during the 1960's probably reflects the increased role of non-family households in the housing market and a combination of preferences and rising home-ownership costs (relative to incomes) for family households. Increases in the proportion of families residing in apartments during the 1960's was probably about one-third due to preferences and two-thirds to a housing cost/income squeeze.

In the early 1970's it appears that a major switch has taken place in the type of accommodation preferred by younger families; fewer families under the age of 35 now want to live in apartments.*

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*Several reports and studies in recent years have concluded that families still have a very strong attachment to low density housing, especially single-detached houses. These include: Report of the Federal Task Force on Housing and Urban Development (Ottawa: Information Canada, 1969); Social Planning Council of Metropolitan Toronto, Families in High Rise Apartments (1973); and David Birch et al., America's Housing Needs: 1970 to 1980 (Cambridge: Joint Center for Urban Studies, 1973).

TECHNICAL APPENDIX C

TRENDS IN VACANCY RATES AND NET REPLACEMENT DEMAND IN THE COLUC AREA

While future housing requirements in the COLUC Area will probably be a function primarily of the growth in total households, consideration should be given to two additional components of housing requirements. A certain proportion of the housing stock at any point of time will be vacant, and this proportion will fluctuate according to supply/demand relationships in the housing market. Vacant units may be dwellings which have been previously occupied or newly constructed units.

A second component of housing requirements in addition to net household formation is what is referred to as net replacement demand. This represents the net effect on the supply of housing of losses from the stock of housing due to demolitions, fires, abandonment, conversions of residential structures to non-residential uses etc. and additions to the housing stock from conversions of non-residential structures to residential uses, etc. Unfortunately however our understanding of the dynamics of housing stock changes is not very far advanced.

1. VACANCY RATES

Table C-1 shows that the average overall housing vacancy

rate in the COLUC Area declined to 2.4 percent in 1966 from 3.6 percent in 1961 and then increased to 4.0 percent in 1971.* By type of unit vacancy rates were about the same in both 1961 and 1971. The vacancy rate for single-detached dwellings was 1.6-1.7 percent and the rate for other dwelling types 5.7-5.8 percent.

Table C-1: HOUSING VACANCY RATES, COLUC AREA,(1) SELECTED YEARS, 1961-1971

	Percent		
	1961	1966	1971
Vacant Dwellings as a Percent of Total Dwellings			
Total	3.6	2.4	4.0
Single-detached dwellings	1.7	(2)	1.6
All other dwellings	5.7	(2)	5.8

(1) Hamilton and Toronto Census Metropolitan Areas only.
(2) Not readily available.

Source: Statistics Canada, Census of Canada.

The fairly high vacancy rate for "other" dwellings in both 1961 and 1971 partially reflects a soft rental market in 1961 and an excess of newly constructed condominiums in 1971. It is apparent however that vacancy rates for apartments will always tend to be higher than the rate for single-detached houses. Typically

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* Data relate to the Toronto-Hamilton Census Metropolitan Areas.

an apartment vacancy rate of around 4-5 percent is considered to be normal. From the data presented in Table C-1 it would appear that the "normal" vacancy rate for single-detached houses in the COLUC Area falls in the 1.5-2.0 percent range.

2. NET REPLACEMENT DEMAND-GENERAL.

Our knowledge of the components and causes of net replacement demand is limited and very little data related to this phenomonon are available. The discussion below brings together what little we know about net replacement demand and probably raises more questions than it answers.

According to CMHC estimates, net replacement demand in Ontario and Canada has been both positive and negative over the 1960's: between 1961 and 1966 net replacement demand as a percentage of total housing requirements in Ontario and Canada amounted to 6.8 percent and 4.0 percent respectively; however, over the 1966-1971 period it is estimated that net replacement demand for these two areas was a minus 7.8 percent and 9.2 percent of total housing requirements.*

It is useful at this point to refer to the CMHC definition of net replacement demand:

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*John S. Kirkland, Demand for Housing in Canada (Ottawa: CMHC, 1973).
A negative net replacement demand means that more dwellings are added to the dwelling stock through conversions than are lost through demolitions, fire, etc.

> Net replacement demand represents the difference between withdrawals from or losses to the housing stock, and additions to the stock resulting from the conversion of existing dwellings. Any undercounting of housing completions in the intercensal surveys of house-building activity would also appear here as an offset to withdrawals from the housing stock. The data are derived from the difference between new housing completions on the one side and net household formation and the net increase in vacancies reported in the Census, on the other.*

Hence net replacement demand is calculated by subtracting net family formation and changes in the number of vacant units from completions of new houses. It is a residual which includes in addition to net changes in the housing stock other than new completions any errors in CMHC completion data or Census data on net family formation or vacancies.

These CMHC estimates of net replacement demand during the 1960's in Ontario and Canada are substantially less than comparable estimates which have made for the same period in the United States. A recent U.S. study estimated that during the 1950's and again in 1960's construction of new dwellings outpaced net household formation by a ratio of 1.5 to 1.0.**

For metropolitan areas in the United States the study forecasts that over the 1970's the ratio of housing requirements to net household formation will rise to 1.64 to 1.0. The components

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*Central Mortgage and Housing Corporation, Canadian Housing Statistics 1972.

**David Birch et al., America's Housing Needs: 1970 to 1980 (Cambridge: Joint Center for Urban Studies, 1973).

of total housing requirements over the 1970's are:

	Percent
Net household formation	66.9
Second homes	0.7
Additional vacancies	5.4
Replacement of accidential losses	12.0
Replacement of other units	21.0
	100.0

Roughly one-third of total housing requirements during the 1970's then are attributed to net replacement demand. The comparable CMHC projection for this period is about 8 percent of Canada's total housing requirements.

It is interesting to speculate on the reasons for these large differences between Canada and the United States on the role of net replacement demand during the 1960's, and whether the recent U.S. experience portends an upsurge in net replacement demand in Canada. While it is beyond the scope of the analysis here to delve into these matters, recent research into the housing abandonment phenomenon in the United States suggests that a unique combination of social and economic forces lie behind the higher net replacement demand in the U.S.*

3. NET REPLACEMENT DEMAND IN THE COLUC AREA

Net replacement demand includes losses from the housing and additions to the stock other than from new residential

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*U.S. Department of Housing and Urban Development, Abandoned Housing Research: A Compendium, 1973.

construction. Limited data for the COLUC Area are available for only one component of net replacement demand -- demolitions.

Over the seven years 1966-1972 approximately 11,000 dwelling units were demolished in the COLUC Area.* Of these most were either single-detached houses (64 percent) or semi-detached and duplex dwellings (17 percent). In addition, over these years there appears to have been a trend toward fewer demolitions (Table C-2).

Most of these demolitions have taken place in the older built-up areas of the COLUC Area. For example, 51 percent of the units demolished were in the City of Toronto and 14 percent in the City of Hamilton.

Demolitions over the seven year period amounted to 1.5 percent of the total housing stock in the COLUC Area in 1966. If this relationship was assumed to hold over a fifteen year period, it would imply that only 3.2 percent of the stock of housing in the COLUC Area at the beginning of the period is removed through demolition.

Demolitions amounted to only 4.4 percent of total housing starts in the 1966-1972 period.

These figures support the conclusion that demolitions in recent years have been a rather insignificant component of

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*Data relate to the Toronto-Hamilton Census Metropolitan Areas.

Table C-2: RESIDENTIAL DEMOLITIONS, COLUC AREA,[1] 1966-1972

	Total	By Type of Dwelling				
		Single-Detached	Semi-Detached and Duplex	Row	Apartment	Total
	Dwelling Units	Percent				
1966	1,830	49.8	26.1	--	24.1	100.0
1967	1,854	55.6	17.2	27.1	--	100.0
1968	1,912	68.2	14.1	7.5	10.2	100.0
1969	1,880	68.4	15.6	6.9	9.1	100.0
1970	1,232	61.8	21.8	4.4	11.9	100.0
1971	1,218	71.8	12.8	4.6	10.8	100.0
1972	1,149	76.4	11.3	3.4	8.9	100.0
1966-72	11,075	63.6	17.3	8.3	10.7	100.0

(1) Hamilton and Toronto Census Metropolitan Areas.

Source: Statistics Canada.

housing requirements in the COLUC Area.

A recent study by the City of Toronto Planning Board provides some insight into the magnitude of net replacement demand in the City over the past two decades.*

Calculations by the consultant from data contained in this study produces some rather unbelievable results (Table C-3). If the figures are to be believed, net replacement demand plus vacancies as a percentage of total housing requirements in the City increased to 41 percent in the first half of the 1960's compared to 14 percent in the 1950's.** Then during the 1966-1971 period net replacement demand plus vacancies plummeted to a minus 46 percent; in other words, in this period the figures suggest that numerous single-detached houses must have subdivided into two or more units and/or numerous non-residential structures were converted to residential uses.

It seems highly unlikely that the very large shifts in the role of net replacement demand plus vacancies indicated in Table C-3 really occurred. What this exercise strongly points to is that much more comprehensive and reliable data are required before Canadian housing analysts are able to reliably estimate past trends or forecast future trends in net replacement demand.

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*City of Toronto Planning Board, Research Section, Changes in the Housing Stock 1951-1971, 1974.

**The study does not present separate figures for net replacement demand and vacancies.

Table C-3: COMPONENTS OF HOUSING REQUIREMENTS IN THE CITY OF TORONTO, SELECTED PERIODS, 1951-1971

	Dwelling Units			Percent		
	1951-1961	1961-1966	1966-1971	1951-1961	1961-1966	1966-1971
New household formation	19,574	7,400	34,314	85.6	59.2	146.0
Net Replacement Demand and Vacancies	3,296	5,096	-10,811	14.0	40.8	-46.0
Demolitions	(6,075)	(4,966)	(4,459)			
Other including vacancies	(-2,779)	(130)	(-15,270)			
New dwelling completions	22,870	12,496	23,503	100.0	100.0	100.0

Source: City of Toronto Planning Board, Research Section, Changes in the Housing Stock 1951-1971, 1974.

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TECHNICAL APPENDIX D

PROJECTION OF HOUSING AND RESIDENTIAL LAND REQUIREMENTS FOR THE COLUC AREA

Based upon the analysis and results presented in the three preceding appendices and assumptions on the future performance of several central housing market relationships, projections are made of total housing requirements by type of unit and concomitant land requirements for the COLUC Area over the 1971-2001 period. In Technical Appendix E these Area projections of housing and residential land requirements are allocated to 23 urban places.

1. DEFINITIONS

Housing requirements refer to the expected number of new dwellings units which will have to be constructed in the COLUC Area to satisfy net household formation, vacancies, and net replacement demand. Housing requirements generated by net household formation are called demographic housing requirements while housing requirements due to an increase in vacancies and net replacement demand are referred to as other housing requirements.

It should be emphasized that housing requirements and

housing needs are not the same. Housing needs generally relate to the number of households paying an unusually high share of their incomes for shelter and households residing in physically substandard or overcrowded accommodation. In contrast, a projection of housing requirements is a forecast of the probable number of new housing units that will have to be constructed in an area over a given period to meet underlying demand.

Separate projections are provided for four types of housing: low density, medium density, and two groupings of high density housing. Low density housing includes single-detached, semi-detached and duplex dwellings.

Medium density housing refers to all types of housing which are not high-rise apartments or classified as low density housing. Traditional types of medium density housing include row dwellings and walk-up apartments. In recent years new forms of medium density housing such as stacked townhouses have emerged. The combination of low and medium density housing is referred to as family-type accommodation.

High density housing includes high-rise apartments which are generally defined to include all apartment buildings having elevators. High density housing is separated into two components -- a lower and a higher. High density housing-lower corresponds to recent suburbon densities for new high rise development while high density-higher corresponds to recent densities in the central cities of the COLUC Area.

Lastly, the projections of residential land requirements are

based upon dwelling densities per gross residential acre. Gross residential acreage is defined to include in addition to the lots on which housing is situated half of the streets adjacent to lots plus community facilities such as schools, local parks and small shopping centres.

2. DEMOGRAPHIC HOUSING REQUIREMENTS BY TYPE*

In this section the household projections for the COLUC Area which were derived in Technical Appendix A are translated into occupied housing units by type, namely low density, medium density and high density housing. Initially, total demographic housing requirements are split into family-type accommodation and high density housing. Then family-type accommodation is separated into low density and medium density housing while high density housing is separated into lower and higher density components. Demographic housing requirements are estimated by calculating the changes in total occupied dwelling units over the 1971-1986 and 1986-2001 periods.

The estimating procedure for projecting total occupied housing units by type appears to assume that all non-family households in 1971, 1986 and 2001 lived in or will live in high density housing

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*It was initially planned to prepare two projections of demographic and total housing requirements -- one based upon a simple extrapolation of past trends and the other based upon a more detailed analysis of the various factors involved. The two projections produced very similar results so only the consultant's "best estimate" of probable housing requirements is presented in this appendix.

and that family households live in both family-type accommodation and high density housing. This is not the case however. The single-detached and owner-occupied housing to family household ratios presented in Tables B-7 and B-8 and the 1961-1971 changes in these ratios presented in Tables B-9 and B-10 relate the total stock of these housing types to the number of family households only.* To the extent that non-family households occupy family-type accommodation, these ratios overstate the proportion of families living in this type of housing. The analysis indirectly therefore does allow for the fact that some non-family households, particularly in the "65 and over" age group, live in family type accommodation.

The approach used to separate total family household housing requirements into family-type accommodation (i.e., low and medium density housing combined) and high density housing includes the following steps.

Step 1: From data included in Tables B-9 and B-10 estimates were made of changes in the family-type accommodation/family households ratios by age of household head in the COLUC

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*It will be recalled that Census data are not available for the type of housing occupied by family and non-family households by age of head separately. Hence, it was necessary to relate the total stock of family-type accommodation to family households, which makes it necessary to assume in the calculations that non-family households live only in high density housing.

In addition, it should be noted again that Statistics Canada staff consider 1971 Census data on the number of single-attached dwellings as unreliable. In the Tables in Technical Appendix B family-type accommodation is approximated by two series -- single-detached dwellings and owner-occupied housing. It would have been more appropriate to approximate family type accommodation by the sum of single-detached and single-attached dwellings.

Area. These estimates are taken from Table B-10 for all age groups except the "Under 25" group where the change shown in Table B-9 is used.* The estimates are shown in Table D-1 under the "Total Change" column for the 1961-1971 decade.

Step 2: The estimated percent change in family-type accommodation/family households ratios by age of head were then sub-divided into two components: a preference induced component and a housing cost/income induced component.

The comparative analysis presented in Technical Appendix B indicated that the family-type accommodation/family household ratios in the younger age groups declined between 1961 and 1971 even in areas such as Winnipeg and Calgary which did not experience a marked deterioration in the housing cost/income relationship. This is suggestive of a relative switch in housing preferences by younger families to high density housing over the period.

The COLUC Area in addition to the above experienced a relatively sharp percent decline in the family-type accommodation/family household ratio in the "25-34" age group and declines, albeit more moderate, in the four age groups above the "25-34"

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*It should be remembered the changes shown in Tables B-9 and B-10 are based on two alternative approximations of family-type accommodation, neither of which is entirely satisfactory. Generally, the owner-occupied housing series is preferred as it is somewhat more comprehensive. However, for the "Under 25" age group the 1961-1971 percent decline in the family-type accommodation/family household is much larger for the owner-occupied dwelling series than for the single-detached dwelling series, i.e., the percent decline in occupancy of single-detached housing was smaller than the percent decline in home-ownership. Since the concern here is with the type of dwelling occupied and not tenure, the percent change in the single-detached dwelling series is used for the "Under 25" age group.

Table D-1: PROJECTED CHANGES IN FAMILY-TYPE ACCOMMODATION/FAMILY HOUSEHOLD RATIOS BY AGE OF HOUSEHOLD HEAD, COLUC AREA, 1971-1986 AND 1986-2001

	1961-1971			15 Year Equivalent of 1961-1971		
	Preference Induced	Cost/Income Induced	Total Change	Preference Induced	Cost/Income Induced	Total Change
Under 25	-21.5	-8.5	-30.0	-32.2	-12.8	-45.0
25-34	-14.6	-10.7	-25.3	-21.9	-16.1	-38.0
35-44	1.4	-6.8	-5.4	2.1	-10.2	-8.1
45-54	2.4	-6.9	-4.5	3.6	-10.4	-6.8
55-64	2.2	-9.7	-7.5	3.3	-14.5	-11.2
65 and over	4.9	-8.1	-3.2	7.4	-12.2	-4.8

	1971-1986			1986-2001		
	Preference Induced	Cost/Income Induced	Total Change	Preference Induced	Cost/Income Induced	Total Change
Under 25	-10.0	-20.0	-30.0	-10.0	-15.0	-25.0
25-34	- 5.0	-25.0	-30.0	- 5.0	-20.0	-25.0
35-44	2.0	-15.0	-13.0	--	-12.0	-12.0
45-54	2.0	-10.0	- 8.0	1.0	- 8.0	- 7.0
55-64	2.0	-15.0	-13.0	1.0	-12.0	-11.0
65 and over	7.0	-12.0	- 5.0	5.0	-10.0	- 5.0

Source: Refer to text.

group. These suggest that the sharp rise in home-ownership housing costs compared to the increase in family income between 1961 and 1971 tended to "push" families into high density housing. Thus, in the COLUC Area the decline in the proportion of families living in family-type accommodation between 1961 and 1971 was probably caused by both cost push forces (the more rapid increase in home-ownership carrying charges compared to income growth) and demand pull forces (housing preferences).

In order to estimate the separate impact of preferences and cost factors on the changes in family-type accommodation/family households ratios by age of head, it is assumed that the average changes in the ratios in Calgary and Winnipeg are indicative of the influence of preferences in the COLUC housing market. The difference between the total change and the estimated change due to preferences is attributed to rising home-ownership housing costs compared to incomes. The resultant breakdown of the total change in each of the ratios between 1961 and 1971 between preferences and cost pressures are presented in Table D-1.

Based on these estimates, it appears that the relatively rapid increase in home-ownership housing costs over the 1960's in the COLUC Area resulted in a reduction in the proportion of families in all age groups living in family-type accommodation; also a shift in preferences appears to have produced a decline in the proportion of families under the age of 35 who live in family-type

accommodation over the decade.

Step 3: The changes in family-type accommodation/family households ratios by age of head between 1961-1971 were extended to a 15-year period by multiplying each change by 1.5. Since these ratios are being projected for two 15-year periods (1971-1986 and 1986-2001), this calculation simply converts the past trend to a comparable period.

Step 4: The family-type accommodation/family household ratios by age group are projected for the 1971-1986 and 1986-2001 periods.

For the 1971-1986 period it is assumed that the increase in home-ownership housing costs compared to incomes will be slightly greater than over the 15-year equivalent of the 1961-1971 period. Hence, the percent reduction in families living in family-type accommodation due to cost pressures will be slightly higher over the 1971-1986 period. In contrast, it is assumed that the influence of preferences will result in a sharp reduction in the rate of decline in the proportion of families preferring to live in family-type housing over the period. Over the 1986-2001 period, it is assumed that the preference-induced changes in the family-type accommodation/family households ratios will be similar to the 1971-1986 period; the housing cost/income induced declines are assumed to be slightly smaller than over the 1971-1986 period. Table D-1 presents the assumed rates of change in the family-type accommodation/family households ratios over the 1971-1986 and

1986-2001 periods.

How reasonable are these assumptions about future trends in housing preferences and home-ownership cost/income relationships? Evidence accumulated during the first few years of the 1970's strongly suggests that more families in the "under 25" and "25-34" age groups are purchasing housing than was the case in the 1960's. In retrospect it appears that many young families in the 1960's merely postponed the decision to buy a home. It is not clear however whether the rate of decline in the family-type accommodation/family ratios for younger families has simply tapered off, stablized or reversed in the early 1970's. It is our "guesstimate" that the rates of decline have slowed down.

Regarding home-ownership costs/income performance, it is evident that in the first years of the 1970's, increases in home-ownership costs in the COLUC Area surpassed increases in income by a wide margin, probably much more than that implicit in the figures in Table D-1. It is felt however that governments in the COLUC Area were unprepared for the recent upsurge in demand for family-type accommodation but have now recognized that a serious problem exists. Thus while governments appear to be reacting with a substantial lag to the shortage of serviced land in the COLUC Area, over the 1971-1986 period as a whole the average annual increase in the ratio of home-ownership cost to family incomes will probably not be as large as the increase

during the early 1970's.

Step 5: The projected rates of change in the ratios of family-type accommodation to family households derived in Step 4 for the 1971-1986 period are then applied to the estimated 1971 ratios of family-type accommodation to family households by age of household head. The following 1971 ratios are used in the calculations.

Age of Household Head	Estimated Ratio of Family-Type Housing to Family Households in 1971
Under 25	35.4
25-34	64.4
35-44	88.8
45-54	92.3
55-64	94.8
65 and over	117.9
	84.6

These ratios are derived from 1971 Census estimates of the stock of single-detached and single-attached dwellings in the COLUC Area.*

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*Because the 1971 Census count of single-attached dwellings (double houses plus row dwellings) probably overstates the actual number of single-attached dwellings, the resultant projections of family-type housing requirements are also overstated by an unknown amount. However, if the two series used earlier to approximate family-type accommodation -- single-detached and owner-occupied dwellings -- were used as the base for the calculations, the projections of family-type housing requirements would be understated. It was decided to use the higher projection in the analysis.

Table D-2 presents the projections of total occupied housing units by type in the COLUC Area for the years 1986 and 2001. Total occupied units are projected to rise from about 985,000 units in 1971 to 1,700,000 units in 1986 and 2,400,000 units in 2001. The stock of family-type accommodation is projected to decline from about 68 percent of total housing units in 1971 to 52 percent in 1986 and 47 percent in 2001. The ratio of the stock of family-type accommodation to the number of family households is expected to decline from about 85 percent in 1971 to 72 percent in 1986 and 66 percent in 2001.

In terms of additional housing units by type required to meet net household formation over the 1971-2001 period, these are as follows:

Table D-3: DEMOGRAPHIC HOUSING REQUIREMENTS, COLUC AREA, 1971-2001

	Increase in Occupied Housing Units Dwelling Units	Percent Distribution Family-type Accommodation	High Density Housing	Total
			Percent	
1971-1986	711,000	31.6	68.4	100.0
1986-2001	698,000	32.9	67.1	100.0
1971-2001	1,409,000	32.2	67.8	100.0

Over the 1971-2001 period it is projected that roughly one-third of demographic housing requirements will be for family-type

Table D-2: PROJECTION OF OCCUPIED HOUSING UNITS BY TYPE AND BY AGE OF HOUSEHOLD HEAD, COLUC AREA, 1971, 1986, 2001

	Occupied Households			Family-Type Accommodation as Percent of Total	Family-Type Accommodation as Percent of Family Households
	Family-Type Accommodation	Other	Total		
	Dwelling Units			Percent	Percent
1971					
Under 25	15,206	50,698	65,904	23.1	35.4
25-34	116,879	98,919	215,798	54.2	64.4
35-44	180,825	44,195	225,020	80.4	88.8
45-54	159,334	37,520	196,854	80.9	92.3
55-64	105,111	38,404	143,515	73.2	94.8
65 and over	87,107	50,618	137,725	63.2	117.9
Total	664,462	320,354	984,816	67.5	84.6
1986					
Under 25	11,751	94,363	106,114	11.1	24.8
25-34	139,471	292,890	432,361	32.2	45.1
35-44	256,884	130,305	387,189	66.3	77.2
45-54	196,988	72,597	269,585	73.1	84.9
55-64	161,018	98,120	259,138	62.1	82.5
65 and over	123,050	118,422	241,472	51.0	112.0
Total	889,162	806,697	1,695,859	52.4	72.5
2001					
Under 25	10,739	152,708	163,447	6.6	18.6
25-34	120,014	376,414	496,428	24.2	33.8
35-44	304,816	216,628	521,444	58.4	68.0
45-54	312,591	147,696	460,287	67.9	79.0
55-64	198,955	162,453	361,408	55.0	73.4
65 and over	171,840	219,497	391,337	43.9	106.4
Total	1,118,955	1,275,396	2,394,351	46.7	66.2

Source: Refer to text.

accommodation and two-thirds high density housing.

Step 6: The next step in the projection of demographic housing requirements is to split family-type housing requirements into low density and medium density housing respectively. Low density housing includes single-detached, semi-detached and duplex dwellings.

Estimates of recent trends in the number of medium density housing units are approximated by the number of row dwelling units constructed. While median density housing includes low-rise apartment structures as well as row units, very few apartment starts in the COLUC Area in recent years have been in smaller structures. Table D-3 shows that over the past four years about 95 percent of apartment starts have been in buildings of 50 or more units. It is assumed that buildings of 50 or more are probably high density housing units.

Table D-4: APARTMENT STARTS BY SIZE OF STRUCTURE, COLUC AREA,(1) 1970-1973

	Size of Structure					
	1-9 Units	10-24 Units	25-49 Units	50-99 Units	100 and More Units	Total
1970	0.8	1.1	1.5	10.1	86.6	100.0
1971	0.4	1.2	4.0	10.5	84.0	100.0
1972	0.6	1.4	2.1	7.6	88.3	100.0
1973 (Jan. -Sept.)	0.9	2.2	2.2	7.3	87.3	100.0

(1) Toronto and Hamilton Census Metropolitan Areas.

Source: Statistics Canada, Housing Starts and Completions.

The relative importance of row dwellings in the new family housing market has risen rapidly over the past 15 or so years in most urban markets across the country. In the COLUC Area, row dwelling starts as a percent of total single-detached, semi-detached, duplex and row starts increased from virtually nil in the 1950's to 23 percent in the 1971-1973 period. Over the entire 1961-1973 period row starts accounted for 17.5 percent of all starts of family-type accommodation in the COLUC Area. In contrast, in the Calgary and Winnipeg markets row dwelling starts accounted for less than 10 percent of all starts of family-type accommodation over this period.

Table D-5: ROW DWELLING STARTS AS PERCENTAGE OF TOTAL STARTS OF FAMILY-TYPE ACCOMMODATION, COLUC AREA, CALGARY AND WINNIPEG, SELECTED PERIODS, 1961-1973

	Percent			
	1961-65	1966-70	1971-73	1961-73
COLUC Area	10.4	19.3	22.8	17.5
Calgary	1.0	9.0	10.7	7.2
Winnipeg	5.3	14.8	9.4	9.8

Source: Central Mortgage and Housing Corporation.

If it is assumed that the average of the Calgary and Winnipeg experience represents the influence of preferences on the volume of median density housing constructed, it appears that in the COLUC Area, high and rising home-ownership costs and preferences

each accounted for about half of the upsurge in row construction over the 1961-1973 period. Over the 1971-1973 period, it is likely that the effect of rapidly rising housing costs outpaced the influence of preferences in the COLUC Area. It is assumed that cost pressures on low density housing will result in approximately 40 percent of all starts of family-type accommodation over the 1971-1986 period being in medium density forms, e.g., row, stacked townhouses, low-rise apartments. This percentage is projected to rise to 65 percent over the 1986-2001 period.

Step 7: The final step in the projection of demographic housing requirements is to separate high density housing (i.e., high rise apartments) into lower and higher density components. The lower density component of high density housing relates to the densities commonly found in the suburban fringes of the COLUC Area while the higher density component relates to densities in the central cities (e.g., City of Toronto).

Data are not available on the proportion of total apartment starts in the COLUC Area which in the past were constructed at these respective densities. As a crude approximation, it is assumed that apartment starts in the Cities of Toronto and Hamilton and the Boroughs of York and East York approximate the proportion of total apartment units constructed at the higher density. During the latest three years, 1971-1973, these areas accounted for 29 percent of total apartment starts in the COLUC Area.

It is assumed that the proportion of high-density housing requirements at the higher density will average 35 percent over the

1971-1986 period and rise to 40 percent over the 1986-2001 period. The impact of rapidly rising land costs is assumed to cause this upward trend in high-rise apartment densities.

Projections of demographic housing requirements separated into four types of housing are presented below.

Table D-6: BREAKDOWN OF DEMOGRAPHIC HOUSING REQUIREMENTS INTO LOW, MEDIUM AND HIGH DENSITY HOUSING, COLUC AREA, 1971-2001

	Family-Type Accommodation		High Density Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
	Dwelling Units				
1971-1986	135,000	90,000	316,000	170,000	711,000
1986-2001	80,000	149,000	281,000	188,000	698,000
1971-2001	215,000	239,000	597,000	358,000	1,409,000
	Percent				
1971-1986	19.0	12.6	44.4	23.9	100.0
1986-2001	11.5	21.3	40.3	26.9	100.0
1971-2001	15.2	17.0	42.4	25.4	100.0

Over the entire 1971-2001 period it is projected that low density and medium density housing will each account for approximately 15 percent of total demographic housing requirements with high density housing accounting for nearly 70 percent of total requirements. A marked shift away from low density to medium density housing is projected to occur in the 1986-2001 period compared to the 1971-1986 period.

3. OTHER HOUSING REQUIREMENTS BY TYPE

Yet to be projected are increases in vacancies and net

replacement demand.

Based upon the analysis contained in Technical Appendix C, it is assumed that the vacancy rates for family-type accommodation will be 1.75 percent of the stock of occupied dwellings in 1986 and 2001; the comparable vacancy rate for high density housing is assumed to be 4.5 percent.

It was not possible to reliably estimate the importance of net replacement demand as a component of housing requirements in the COLUC Area over the last decade. What limited information there is available suggests that net replacement demand has been fairly small.

It was decided to disregard net replacement demand in the projections of housing requirements. This assumption appears reasonable providing it is assumed: (a) that unrealistic rent ceilings are not imposed on privately-owned rental accommodation over the 1971-2001 period; (b) that government subsidized rental direct construction housing programs (excluding rent supplement programs) account for no more than 15-20 percent of rental housing starts over the period; or (c) that social conditions in the central cities of the COLUC Area do not deteriorate over the 1971-2001 period as they have in many large U.S. urban areas. Any one of these conditions could conceivably lead to a sharp upswing in net replacement demand.

Increases in the number of vacant dwellings under the assumptions mentioned above will be the following:

Table D-7: PROJECTED INCREASE IN VACANT HOUSING UNITS, COLUC AREA, 1971-2001

	Family-Type Accommodation		High Density Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
	Dwelling Units				
1971-1986	3,000	1,000	15,000	8,000	27,000
1986-2001	2,000	3,000	21,000	14,000	40,000
1971-2001	5,000	4,000	36,000	22,000	67,000

4. TOTAL HOUSING REQUIREMENTS BY TYPE

Total housing requirements which consist of demographic housing requirements plus the increase in vacant units over the 1971-2001 period in the COLUC Area are projected at the following;

Table D-8: PROJECTIONS OF TOTAL HOUSING REQUIREMENTS COLUC AREA, 1971-2001

	Family-Type Accommodation		High Density Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
	Dwelling Units				
1971-1986	138,000	91,000	331,000	178,000	738,000
1986-2001	82,000	152,000	302,000	202,000	738,000
1971-2001	220,000	243,000	633,000	380,000	1,476,000
	Percent				
1971-1986	18.7	12.3	44.9	24.1	100.0
1986-2001	11.1	20.6	40.9	27.4	100.0
1971-2001	14.9	16.5	42.9	25.7	100.0

Over the 1971-2001 period the projections indicate that about 1.5 million new housing units will be required in the COLUC Area. While

total housing requirements over each of the 1971-1986 and 1986-2001 periods are expected to be about the same, this is not true for each housing type. The major shift in housing types in the 1986-2001 period compared to the 1971-1986 period is a sharp drop in the proportion of low density units and a correspondingly sharp increase in medium density units.

5. RESIDENTIAL LAND REQUIREMENTS

The preceding projections of COLUC Area housing requirements are translated into residential land requirements by applying appropriate density ratios to each of the types of housing. These density ratios for the 1971-2001 period are derived from a recent study of residential developments approved in 1971 within the Municipality of Metropolitan Toronto.* This study indicates average units per gross residential acre of the following:

Type of Housing	Areas	Average Units Per Acre
Single-detached	City plus Boroughs	4.5
Semi-detached	City plus Boroughs	7.0
Row	City plus Boroughs	15.0
Apartments	City plus York, East York	120.0
Apartments	Scarborough, North York and Etobicoke	50.0

In the calculations it is assumed that semi-detached units will account for an increasing proportion of low density housing starts over the 1971-2001 period. Average density for low density housing is projected to rise to 6.0 units per acre over the 1971-

*This study was undertaken by the Metropolitan Toronto Planning Board Research Division.

1986 period and 6.5 units over the 1986-2001 period.

For medium density housing, which includes new forms of low rise multiple housing structures in addition to the conventional row or townhouse developments, it is assumed that the density ratio over the 1971-1986 and 1986-2001 periods will be 25 and 35 units per gross acre respectively. The densities for high density housing are assumed to remain at 50 and 120 units per acre respectively for high rise development in suburban areas and central cities over both the 1971-1986 and 1986-2001 periods.

The density assumptions used in the projections of residential land requirements then are the following:

Type of Housing	Average Units Per Acre	
	1971-1986	1986-2001
Low density	6.0	6.5
Medium density	25.0	35.0
High density - lower	50.0	50.0
- higher	120.0	120.0

The resultant projections of residential land requirements indicate that a total of about 59,500 acres of land will be needed over the entire 1971-2001 period, with almost 60 percent of this land needed during the 1971-1986 period. Most of the land is needed to provide for low density housing. It should be noted that while most of the land requirements will be for previously undeveloped land, a portion of high density housing will be on redeveloped sites.

Table D-9: PROJECTIONS OF RESIDENTIAL LAND REQUIREMENTS, COLUC AREA, 1971-2001

	Family-Type Accommodation		High Density Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
	Gross Residential Acres				
1971-1986	23,000	3,640	6,620	1,483	34,743
1986-2001	12,615	4,343	6,040	1,683	24,681
1971-2001	35,615	7,983	12,660	3,166	59,424
	Percent				
1971-1986	66.2	10.5	19.0	4.3	100.0
1986-2001	51.1	17.6	24.5	6.8	100.0
1971-2001	59.9	13.4	21.3	5.3	100.0

TECHNICAL APPENDIX E

PROJECTION OF RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE

The primary purpose of this appendix is to allocate the projections of total residential land requirements for the overall COLUC Area over the 1971-1986 and 1986-2001 periods derived in Technical Appendix D among 23 urban places.* In addition, since the COLUC Task Force is also concerned with land requirements between the year 2001 and the time at which each urban place reaches a mature state, some very crude projections of residential land requirements over this far-away period are also presented.

The general approach underlying the projections of residential land requirements by urban place is very similar to that employed for the overall COLUC Area projections. The population allocations by urban place provided to us by the COLUC Support Staff are translated into projections of households. Total new housing requirements are based on these household projections together with a projected proportional increase in vacant units. Assumptions are then made as to the likely composition of new housing requirements by type of unit in each urban place. Lastly, density ratios (dwellings per acre) are applied to the projected housing

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*Actually the total COLUC Area residential land requirements projections are allocated among 24 areas -- 23 urban areas plus a residual area (Rest of COLUC Area).

requirements by type in each urban place as a basis for projecting total residential land requirements for each urban place within the COLUC Area.

The results contained in this appendix should be treated with considerably greater caution than the overall COLUC Area projections presented in earlier appendices. While the projections of residential land requirements for each urban place represent the consultant's "best estimates", it has to be recognized that ultimate land requirements in each urban place will be the product of a complex interaction of numerous social, economic, environmental, engineering, and political forces over the forecast periods.

For purposes of the present study, it was not practical to carry out a detailed investigation of the housing markets in each of 23 urban places and determine how local nuances might influence the types of housing constructed (and residential densities) over a period extending for more than 30 years. Instead, what is done is to assume that dwelling types and densities by urban place are a product of the underlying forces of land economics -- residential densities will be highest in the urban places where serviced land costs are the highest (e.g., Metro Toronto and lowest in places where serviced land is the cheapest (e.g., the outlying urban places).

This appendix is presented in three parts. The first section describes the Residential Land Allocation Model which is used to allocate the projections of overall COLUC Area housing

and residential land requirements to each of 23 urban places. Next the analysis underlying the allocation of total COLUC Area housing requirements among urban places is presented. And lastly, the COLUC Area housing requirements by type of unit and the resultant residential land requirements are allocated to each urban place.

1. THE RESIDENTIAL LAND ALLOCATION MODEL

In our Phase 1 Report it was recommended to the COLUC Task Force that it should consider the desirability of having a computer model developed which would aid in the allocation of total COLUC Area housing and residential land requirements to individual urban places. Such a model it was thought would enable the relatively easy manipulation of the many data involved. In addition, it would provide flexibility to examine the effect of alternative population, household, housing mix and density assumptions on residential land requirements by urban place. Subsequently Woods, Gordon and Company, Management Consultants, were asked to develop this model.*

The model, which is referred to as the Residential Land Allocation Model, does not contain behavioral equations. It is simply a computational aid.

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*Woods, Gordon and Company are preparing a concise users' manual for this model. COLUC Support Staff and others will be able to determine the land requirements projections of alternatives other than those that are analyzed in this study.

The model begins with total COLUC Area population for the years 1971, 1986, 2001 and maturity allocated among 23 urban places and a residual area (Rest of COLUC Area). Total households in each urban place are derived by applying estimates of the average number of persons per household in each place for each point in time. The user can input estimates of average household size for several of the urban areas and the model then computes average household sizes for the remaining areas in such a way that the weighted average household size of all the urban places is the same as the average household size for the overall COLUC Area.

Next an overall vacancy rate (vacant units as a percent of total households) is applied to the number of households in each urban place and the resultant vacant units are added to total households. Housing requirements for each of four periods (1971-1986, 1986-2001, 2001-maturity and 1971-maturity) are calculated by taking the change in the sum of vacant units and households at the beginning and end of each period.

The user then inputs assumptions about the percent composition of total housing requirements by type of unit in several urban places and the model computes the percent composition of the unallocated units. The weighted average of the percent composition of housing requirements by type in all the urban places will be equal to the assumed composition for the overall COLUC Area.

Lastly, density ratios (units per acre) are then inputed

for each housing type and the model calculates residential land requirements for a given period for each urban place.

In summary the model includes the following variables by urban place:

-total population
-average household size
-total households
-total vacant units
-total new housing requirements
-new housing requirements by type of dwelling unit
-density ratios by type of dwelling unit
-residential land requirements.

The user is able to substitute alternative values for each of these variables and determine the implications for residential land requirements by urban place.

2. TOTAL NEW HOUSING REQUIREMENTS BY URBAN PLACE

Allocations of total COLUC Area population among 23 urban places and by year (1971, 1986, 2001 and maturity) were provided to the consultant by the COLUC Support Staff (Table E-1). The task at hand is to quantify the implications for residential land requirements by urban place of these specific population allocations.

Table E-2 compares the profiles of population growth within the COLUC Area over the 15 years prior to 1971 and over the 3 forecast periods.*

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*It should be noted that the boundaries of urban places as defined by the COLUC Task Force do not necessarily coincide with municipal boundaries. For example, Metro Toronto includes in addition to the Municipality of Metropolitan Toronto fringe areas to the north.

Table E-1: TOTAL POPULATION BY URBAN PLACE, COLUC AREA, SELECTED YEARS, 1971-MATURITY

	Persons			
	1971	1986	2001	Maturity
West Sector	(752,000)	(990,000)	(1,603,000)	(2,350,000)
1. Hamilton	354,000	400,000	600,000	700,000
2. Burlington	80,100	100,000	135,000	150,000
3. North Burlington	700	1,000	10,000	70,000
4. Milton	7,000	9,000	11,000	20,000
5. Oakville	56,700	66,000	90,000	200,000
6. North Oakville	900	1,000	20,000	150,000
7. Mississauga	143,600	225,000	360,000	440,000
8. Erin Mills	9,300	54,000	186,000	270,000
9. Malton	17,900	18,000	30,000	35,000
10. Brampton-Bramalea	64,800	92,000	130,000	275,000
11. Georgetown	17,000	24,000	31,000	40,000
East Sector	(163,600)	(391,000)	(738,000)	(1,135,000)
12. North Pickering	1,800	30,000	120,000	200,000
13. South Pickering	20,800	58,000	90,000	120,000
14. Ajax	13,300	24,000	45,000	120,000
15. Oshawa-Whitby	115,100	260,000	400,000	450,000
16. Columbus	1,100	1,000	33,000	150,000
17. Bowmanville	8,600	15,000	35,000	25,000
18. Audley	2,900	3,000	15,000	70,000
North Sector	(69,000)	(124,000)	(168,000)	(300,000)
19. Woodbridge	3,300	6,000	12,000	20,000
20. Markham	10,900	18,000	21,000	35,000
21. Richmond Hill	24,600	45,000	60,000	95,000
22. Newmarket-Aurora	30,200	55,000	75,000	150,000
23. Metro Toronto	2,104,000	2,577,000	2,815,000	2,900,000
24. Rest of COLUC Area	236,400	304,000	354,000	515,000
Total COLUC Area	3,325,000	4,386,000	5,678,000	7,200,000

Source: COLUC Support Staff.

Table E-2: PROJECTED INCREASE IN POPULATION BY URBAN PLACE, COLUC AREA, SELECTED PERIODS, 1956-MATURITY

	Increase in Population--Percent Distribution			
	1956-1971	1971-1986	1986-2001	2001-Maturity
West Sector	(28.8)	(22.3)	(47.4)	(49.0)
1. Hamilton	8.1	4.3	15.5	6.6
2. Burlington	4.3	1.9	2.7	1.0
3. North Burlington	--	--	0.7	3.9
4. Milton	0.2	0.2	0.2	0.6
5. Oakville	2.8	0.8	1.9	7.2
6. North Oakville	--	--	1.5	8.5
7. Mississauga	7.7	7.7	10.4	5.3
8. Erin Mills	0.1	4.2	10.2	5.5
9. Malton	0.8	--	0.9	0.3
10. Brampton-Bramalea	4.0	2.6	2.9	9.5
11. Georgetown	0.8	0.6	0.5	0.6
East Sector	(5.8)	(21.4)	(26.8)	(26.1)
12. North Pickering	--	2.6	7.0	5.2
13. South Pickering	0.9	3.5	2.5	2.0
14. Ajax	0.6	1.0	1.6	4.9
15. Oshawa-Whitby	4.1	13.7	10.8	3.3
16. Columbus	--	--	2.5	7.7
17. Bowmanville	0.1	0.6	1.5	-0.6
18. Audley	0.1	--	0.9	3.6
North Sector	(3.0)	(5.2)	(3.4)	(8.7)
19. Woodbridge	0.1	0.3	0.5	0.5
20. Markham	0.6	0.6	0.2	1.0
21. Richmond Hill	1.0	1.9	1.2	2.3
22. Newmarket-Aurora	1.3	2.4	1.5	4.9
23. Metro Toronto	55.2	44.6	18.4	5.6
24. Rest of COLUC	7.2	6.5	4.0	10.6
Total COLUC	100.0	100.0	100.0	100.0

Source: COLUC Support Staff.

Over the 1956-1971 period population growth was centred in Metro Toronto and in the urban places west of Metro Toronto. Roughly 55 percent of the total population increase in the COLUC Area over the period occurred in Metro Toronto, with Hamilton and Mississauga a distant second and third (8.1 percent and 7.7 percent of total growth respectively).

The population allocations for the 1971-1986 period presage rapid population growth in the urban places east of Metro Toronto (much greater than over the preceding 15 years) and continued strong growth in Metro Toronto. Metro Toronto is expected to account for almost 45 percent of total COLUC Area population growth over the period followed by Oshawa (13.7 percent) and Mississauga (7.7 percent).

The 1986-2001 population allocations envisage a sharp upward shift in the share of population growth accruing to the municipalities west of Metro Toronto and a concomitant decline in the Metro Toronto share. Over this period, Metro Toronto's share of total COLUC Area population growth is expected to drop to about 18 percent. Rapid population growth is anticipated for Hamilton (15.5 percent of total COLUC Area growth), Oshawa (10.8 percent), Mississauga (10.4 percent), Erin Mills (10.2 percent), and North Pickering (7.0 percent).

Over the 2001-maturity period significant population growth is expected to occur in several urban places: Brampton-Bramalea (9.5 percent of total COLUC Area population growth), North

Oakville (8.5 percent), Columbus (7.7 percent), Oakville (7.2 percent), and Hamilton (6.6 percent). Metro Toronto is expected to account for less than 6 percent of COLUC Area population growth in this period.

Tables E-3 and E-4 summarize trends in average household and average family sizes over the 1961-1971 decade for selected municipalities in the COLUC Area.*

The data in these tables indicate over the 1961-1971 decade that: (a) the decline in average household size in the overall COLUC Area was much sharper than the decline in average family size; (b) changes in average household size were not uniform among urban places -- the general pattern was for average household size to decline sharply in the larger central cities of the COLUC Area (e.g., the City of Toronto or the City of Hamilton) while rapidly developing newer areas such as Chinguacousy Township and Markham experienced slight increases in average household size; and (c) the declines in average household size by urban place tended to be much sharper than the declines in average family size (or the increases smaller).

These trends are indicative of a rapid growth in the importance of non-family households over the decade with such growth being centred in the larger central cities within the COLUC Area. In contrast, the newer rapidly developing areas appear to have

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*These data were not readily available on the COLUC boundaries for urban places.

Table E-3: AVERAGE HOUSEHOLD SIZE IN SELECTED MUNICIPALITIES, COLUC AREA, 1961, 1966 and 1971(1)

	Average Number of Persons Per Household			Percent Change 1961-1971
	1961	1966	1971	Percent
West Sector				
City of Hamilton	3.6	3.4	3.2	-11.1
Town of Burlington	3.8	3.8	3.6	- 5.3
Town of Milton	3.8	3.7	3.4	-10.5
Town of Oakville	3.5	3.9	3.7	5.7
Town of Mississauga	(2)	(2)	3.7	(2)
Town of Brampton	3.7	3.9	3.6	- 2.7
Chinguacousy Township	3.9	4.2	4.0	2.6
Town of Georgetown	3.8	4.0	3.8	--
East Sector				
Pickering Township	3.9	4.2	4.0	2.6
Town of Ajax	4.2	4.1	3.8	- 9.5
City of Oshawa	3.6	3.5	3.4	- 5.6
Town of Whitby	3.7	3.7	3.6	- 2.7
Town of Bowmanville	3.5	3.5	3.3	- 5.7
North Sector				
Town of Vaughan	(2)	(2)	3.7	(2)
Town of Markham	3.7	3.9	3.8	2.7
Town of Richmond Hill	4.0	4.0	3.7	- 7.5
Town of Newmarket	3.6	3.6	3.5	- 2.8
Town of Aurora	3.7	3.9	3.7	--
Metropolitan Toronto				
City of Toronto	3.7	3.6	3.0	-18.9
Borough of Etobicoke	3.7	3.7	3.4	- 8.1
Borough of Scarborough	3.9	3.9	3.6	- 7.7
Borough of York	3.6	3.5	3.2	-11.1
Borough of East York	3.2	3.0	2.7	-15.6
Borough of North York	3.8	3.7	3.4	-10.5
COLUC Area	3.8	3.7	3.4	-10.5

(1) Average size of private households.
(2) Not available.

Source: Statistics Canada, Census of Canada.

Table E-4: AVERAGE FAMILY SIZE IN SELECTED MUNICIPALITIES, COLUC AREA, 1961, 1966 AND 1971

	Average Number of Persons Per Family			Percent Change 1961-1971
	1961	1966	1971	Percent
West Sector				
City of Hamilton	3.5	3.5	3.4	-2.9
Town of Burlington	3.7	3.8	3.7	--
Town of Milton	3.7	3.8	3.5	-5.4
Town of Oakville	3.4	3.9	3.7	8.8
Town of Mississauga	(1)	(1)	3.7	(1)
Town of Brampton	3.6	3.8	3.6	--
Chinguacousy Township	3.8	4.1	4.0	5.3
Town of Georgetown	3.8	4.0	3.8	--
East Sector				
Pickering Township	3.9	4.1	3.9	--
Town of Ajax	4.1	4.1	3.8	-7.3
City of Oshawa	3.5	3.6	3.6	2.8
Town of Whitby	3.7	3.8	3.8	2.7
Town of Bowmanville	3.7	3.7	3.6	-2.7
North Sector				
Town of Vaughan	(1)	(1)	3.6	(1)
Town of Markham	3.7	3.9	3.8	2.7
Town of Richmond Hill	3.9	4.0	3.8	-2.6
Town of Newmarket	3.6	3.7	3.6	--
Town of Aurora	3.7	4.0	3.8	2.7
Metropolitan Toronto				
City of Toronto	3.2	3.3	3.2	--
Borough of Etobicoke	3.6	3.6	3.5	-2.8
Borough of Scarborough	3.7	3.8	3.6	-2.7
Borough of York	3.2	3.3	3.2	--
Borough of East York	3.0	3.1	2.9	-3.3
Borough of North York	3.5	3.6	3.4	-2.9

(1) Not available

Source: Statistics Canada, Census of Canada.

attracted mostly families.

In our projections of average household size by urban place, it is assumed that a similar pattern will persist over the forecast period. Hence, the largest percent declines in average household size over the 1971-1986 and 1986-2001 periods are assumed for Metro Toronto followed by Hamilton. The smallest declines are assumed to occur in the new communities of North Burlington, North Oakville, Columbus and Audley. The remaining urban areas fall between these two extremes.

Table E-5 outlines the assumed rates of decline in average household size by urban place and the resultant projections of average household size, again by urban place, for 1986 and 2001.*

For the 2001-maturity period, it is assumed that the average household size at mature state will be the same as in the year 2001.** By urban place it is assumed that average household size in Toronto and Hamilton will be the same in 2001 and maturity. The assumption of no change in average household size in the overall COLUC Area, Metro Toronto and Hamilton results in a moderate reduction in average household size in the other urban places.

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*The numbers in Tables E-5 through E-9 relate to the urban places having the same numbers in Tables E-1 and E-2.

**Average household size is assumed to be 2.4 persons per household in both 2001 and maturity. Due to rounding Table E-5 shows a small increase in average household size over the period -- from 2.37 to 2.4 persons.

Table E-5: PROJECTIONS OF AVERAGE HOUSEHOLD SIZE BY URBAN PLACE, COLUC AREA, 1986, 2001 AND MATURITY

AREA	1971 *AV. SIZE*	*P.C. CHANGE*	1986 *AV. SIZE*	*P.C. CHANGE*	2001 *AV. SIZE*	*P.C. CHANGE*	*MATURITY AV. SIZE*	*OVERALL P.C. CHANGE*
1	3.36	-24.00	2.55	-10.00	2.30	0.00	2.30	-31.60
2	3.66	-5.66	3.45	-9.52	3.12	-10.76	2.79	-23.82
3	3.91	-5.00	3.72	-4.00	3.57	-10.00	3.21	-17.92
4	3.61	-4.35	3.45	-9.52	3.12	-10.76	2.79	-22.77
5	3.80	-9.13	3.45	-9.52	3.12	-10.76	2.79	-26.63
6	3.90	-5.00	3.70	-4.00	3.55	-10.00	3.20	-17.92
7	3.62	-15.00	3.08	-9.00	2.80	0.00	2.80	-22.65
8	3.72	-7.18	3.45	-9.52	3.12	-10.76	2.79	-25.05
9	4.15	-16.80	3.45	-9.52	3.12	-10.76	2.79	-32.82
10	3.82	-9.61	3.45	-9.52	3.12	-10.76	2.79	-27.02
11	3.80	-9.13	3.45	-9.52	3.12	-10.76	2.79	-26.63
12	3.90	-11.37	3.45	-9.52	3.12	-10.76	2.79	-28.44
13	4.06	-14.95	3.45	-9.52	3.12	-10.76	2.79	-31.33
14	3.84	-10.07	3.45	-9.52	3.12	-10.76	2.79	-27.39
15	3.54	-15.00	3.01	-9.00	2.74	0.00	2.74	-22.65
16	3.90	-5.00	3.71	-4.00	3.56	-10.00	3.20	-17.92
17	3.42	0.98	3.45	-9.52	3.12	-10.76	2.79	-18.47
18	3.90	-5.00	3.70	-4.00	3.55	-10.00	3.20	-17.92
19	3.72	-7.19	3.45	-9.52	3.12	-10.76	2.79	-25.06
20	3.84	-10.06	3.45	-9.52	3.12	-10.76	2.79	-27.38
21	3.73	-7.43	3.45	-9.52	3.12	-10.76	2.79	-25.26
22	3.75	-7.92	3.45	-9.52	3.12	-10.76	2.79	-25.66
23	3.31	-30.00	2.32	-12.00	2.04	0.00	2.04	-38.40
24	3.23	7.00	3.45	-9.52	3.12	-10.76	2.79	-13.60

SUMMARY:

TOTAL POPULATION:	3325000	4386000	5678000	7200000	
TOTAL HOUSEHOLDS:	984816	1695859	2394351	3000000	
OVERALL AVERAGE SIZES:	3.38	2.59	2.37	2.40	
PERCENTAGE CHANGES IN SIZES:		-23.40	-8.31	1.21	-28.92

What this implies is that over the period these "other" urban places experience a relative increase in smaller non-family households.

Lastly, a vacancy factor is applied to total households in each urban place in 1971, 1986, 2001, and maturity and new housing requirements are calculated by taking the change in the combined stock of households and vacant units over each period. The vacancy rates (vacant units as a percent of total households) used in the calculations are: 1971 - 2.6 percent; 1986 - 3.0 percent; 2001 - 3.2 percent; and maturity - 3.4 percent.

Table E-6 presents the projections of total housing requirements by urban area and period. One of the more notable features of these projections is the significant role of Metro Toronto in the first two periods. Over the 1971-1986 period it is projected that Metro Toronto will account for 67 percent of total COLUC Area new housing requirements. In the 1986-2001 period the importance of Metro Toronto declines sharply but this area still is expected to account for about 39 percent of the total COLUC Area housing requirements.

3. NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS

Projections of housing mix by urban place for each time period were made by inputing intuitively reasonable assumptions into the model for several groupings of urban places and then allowing

Table E-6: PROJECTIONS OF NEW HOUSING REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1986, 2001 AND MATURITY

AREA	1971-1986	1986-2001	2001-*MAT.*	1971-*MAT.*
1	53253	108101	45521	206875
2	7375	14762	11039	33176
3	94	2616	19656	22366
4	695	949	3784	5428
5	4379	10040	44446	58865
6	41	5530	42691	48263
7	34617	57365	29799	121780
8	13543	45329	38698	97570
9	944	4540	3071	8555
10	10039	15497	59049	84585
11	2569	3080	4595	10244
12	8475	30688	34537	73700
13	12045	12427	14777	39248
14	3605	7705	29641	40950
15	55640	61757	19173	136570
16	-11	9295	38870	48154
17	1894	7086	-2289	6691
18	71	3520	18269	21860
19	880	2174	3454	6507
20	2456	1567	6044	10068
21	6657	6395	15414	28466
22	8144	8367	30857	47368
23	493390	279197	45865	818453
24	15519	26247	74069	115835
TOTAL	736314(1)	724235(1)	631030	2091579

(1) Total housing requirements here differ slightly from those in Table 1 due to the use of a single overall vacancy rate rather than separate rates for family-type accommodation and high density housing.

the model to calculate the mix in the remaining urban areas. The mixes calculated by the model for "other" urban places were compared with the inputed assumptions; at this point the initial assumptions were adjusted and the model was run again. This process was carried out several times until the housing mixes in each grouping of urban places appeared to have a reasonable relationship with each other.

Once the housing mix in each urban place was determined, density ratios were applied to the housing types by urban place. The overall COLUC Area density ratios by type of housing used in Technical Appendix D were applied to each housing type by urban place. The 1986-2001 density ratios were assumed to be applicable to the 2001-maturity period.

Projections of housing requirements by type of unit and residential land requirements by urban place for the 1971-1986, 1986-2001, and 2001-maturity periods are presented in Tables E-7, E-8, and E-9. A summary of residential land requirements by urban place for the entire 1971-maturity period is included in Table E-10.

Of the nearly 35,000 acres of land required for residential uses during the 1971-1986 period in the overall COLUC Area, some 42 percent (14,800 acres) is expected to be needed in Metro Toronto. The urban places west of Metro Toronto are expected to need about 9,500 acres of new residential land compared to 6,800 acres in the places east of Metro Toronto and only 2,000 acres

Table E-7: PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1971-1986

AREA	LOW			MED			HI-RISE/LOW			RI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	10651	0.20	1775	7988	0.15	320	25029	0.47	501	9586	0.18	80	53253	1.00	2675
2	4610	0.63	768	926	0.13	37	1481	0.20	30	359	0.05	3	7375	1.00	838
3	84	0.90	14	9	0.10	0	0	0.00	0	0	0.00	0	94	1.00	14
4	435	0.63	72	87	0.13	3	140	0.20	3	34	0.05	0	695	1.00	79
5	2737	0.63	456	550	0.13	22	879	0.20	18	213	0.05	2	4379	1.00	497
6	37	0.90	6	4	0.10	0	0	0.00	0	0	0.00	0	41	1.00	6
7	10385	0.30	1731	6923	0.20	277	15231	0.44	305	2077	0.06	17	34617	1.00	2330
8	8464	0.63	1411	1701	0.13	68	2719	0.20	54	659	0.05	5	13543	1.00	1539
9	590	0.63	98	119	0.13	5	190	0.20	4	46	0.05	0	944	1.00	107
10	6275	0.63	1046	1261	0.13	50	2015	0.20	40	488	0.05	4	10039	1.00	1141
11	1605	0.63	268	323	0.13	13	516	0.20	10	125	0.05	1	2569	1.00	292
12	5509	0.65	918	1271	0.15	51	1695	0.20	34	0	0.00	0	8475	1.00	1003
13	7829	0.65	1305	1807	0.15	72	2409	0.20	48	0	0.00	0	12045	1.00	1425
14	2253	0.63	376	453	0.13	18	724	0.20	14	175	0.05	1	3605	1.00	410
15	16692	0.30	2782	11128	0.20	445	24482	0.44	490	3338	0.06	28	55640	1.00	3745
16	10	0.90	2	1	0.10	0	0	0.00	0	0	0.00	0	11	1.00	2
17	1184	0.63	197	238	0.13	10	380	0.20	8	92	0.05	1	1894	1.00	215
18	64	0.90	11	7	0.10	0	0	0.00	0	0	0.00	0	71	1.00	11
19	550	0.63	92	110	0.13	4	177	0.20	4	43	0.05	0	880	1.00	100
20	1535	0.63	256	308	0.13	12	493	0.20	10	120	0.05	1	2456	1.00	279
21	4161	0.63	693	836	0.13	33	1336	0.20	27	324	0.05	3	6657	1.00	756
22	5090	0.63	848	1023	0.13	41	1635	0.20	33	396	0.05	3	8144	1.00	925
23	39471	0.08	6579	49339	0.10	1974	246695	0.50	4934	157885	0.32	1316	493390	1.00	14802
24	9699	0.63	1617	1949	0.13	78	3116	0.20	62	755	0.05	6	15519	1.00	1763
TOTAL	139900	0.19	23317	88358	0.12	3534	331341	0.45	6627	176715	0.24	1473	736314	1.00	34950

Table E-8: PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1986-2001

AREA	LOW			MED			HI-RISE/LOW			HI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	9729	0.09	1497	20539	0.19	587	45402	0.42	908	32430	0.30	270	108101	1.00	3262
2	2760	0.19	425	6071	0.41	173	5925	0.40	119	6	0.00	0	14762	1.00	717
3	1047	0.40	161	916	0.35	26	654	0.25	13	0	0.00	0	2616	1.00	200
4	177	0.19	27	390	0.41	11	381	0.40	8	0	0.00	0	949	1.00	46
5	1877	0.19	289	4129	0.41	118	4030	0.40	81	4	0.00	0	10040	1.00	487
6	2212	0.40	340	1936	0.35	55	1383	0.25	28	0	0.00	0	5530	1.00	423
7	6884	0.12	1059	14341	0.25	410	27535	0.48	551	8605	0.15	72	57365	1.00	2091
8	8474	0.19	1304	18642	0.41	533	18195	0.40	364	18	0.00	0	45329	1.00	2200
9	849	0.19	131	1867	0.41	53	1822	0.40	36	2	0.00	0	4540	1.00	220
10	2897	0.19	446	6373	0.41	182	6220	0.40	124	6	0.00	0	15497	1.00	752
11	576	0.19	89	1267	0.41	36	1236	0.40	25	1	0.00	0	3080	1.00	150
12	9206	0.30	1416	12275	0.40	351	9206	0.30	184	0	0.00	0	30688	1.00	1951
13	3728	0.30	574	4971	0.40	142	3728	0.30	75	0	0.00	0	12427	1.00	790
14	1440	0.19	222	3169	0.41	91	3093	0.40	62	3	0.00	0	7705	1.00	374
15	7411	0.12	1140	15439	0.25	441	29643	0.48	593	9263	0.15	77	61757	1.00	2251
16	3718	0.40	572	3253	0.35	93	2324	0.25	46	0	0.00	0	9295	1.00	711
17	1325	0.19	204	2914	0.41	83	2844	0.40	57	3	0.00	0	7086	1.00	344
18	1408	0.40	217	1232	0.35	35	880	0.25	18	0	0.00	0	3520	1.00	269
19	406	0.19	63	894	0.41	26	873	0.40	17	1	0.00	0	2174	1.00	106
20	293	0.19	45	645	0.41	18	629	0.40	13	1	0.00	0	1567	1.00	76
21	1195	0.19	184	2630	0.41	75	2567	0.40	51	3	0.00	0	6395	1.00	310
22	1564	0.19	241	3441	0.41	98	3358	0.40	67	3	0.00	0	8367	1.00	406
23	5584	0.02	859	13960	0.05	399	114471	0.41	2289	145182	0.52	1210	279197	1.00	4757
24	4907	0.19	755	10795	0.41	308	10536	0.40	211	11	0.00	0	26247	1.00	1274
TOTAL	79666	0.11	12256	152089	0.21	4345	296937	0.41	5939	195544	0.27	1630	724235	1.00	24170

Table E-9: PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 2001-MATURITY

AREA	LOW			MED			HI-RISE/LOW			HI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	910	0.02	140	2276	0.05	65	18664	0.41	373	23671	0.52	197	45521	1.00	776
2	1125	0.10	173	2175	0.20	62	4608	0.42	92	3132	0.28	26	11039	1.00	353
3	3931	0.20	605	6880	0.35	197	8845	0.45	177	0	0.00	0	19656	1.00	978
4	386	0.10	59	745	0.20	21	1580	0.42	32	1073	0.28	9	3784	1.00	121
5	4529	0.10	697	8755	0.20	250	18553	0.42	371	12609	0.28	105	44446	1.00	1423
6	8538	0.20	1314	14942	0.35	427	19211	0.45	384	0	0.00	0	42691	1.00	2125
7	2682	0.09	413	5662	0.19	162	12516	0.42	250	8940	0.30	74	29799	1.00	899
8	3944	0.10	607	7623	0.20	218	16153	0.42	323	10978	0.28	91	38698	1.00	1239
9	313	0.10	48	605	0.20	17	1282	0.42	26	871	0.28	7	3071	.00	98
10	6018	0.10	926	11632	0.20	332	24649	0.42	493	16751	0.28	140	59049	1.00	1891
11	468	0.10	72	905	0.20	26	1918	0.42	38	1304	0.28	11	4595	1.00	147
12	5181	0.15	797	10361	0.30	296	15542	0.45	311	3454	0.10	29	34537	1.00	1433
13	2217	0.15	341	4433	0.30	127	6650	0.45	133	1478	0.10	12	14777	1.00	613
14	3021	0.10	465	5839	0.20	167	12373	0.42	247	8408	0.28	70	29641	1.00	949
15	1726	0.09	265	3643	0.19	104	8053	0.42	161	5752	0.30	48	19173	1.00	579
16	7774	0.20	1196	13604	0.35	389	17491	0.45	350	0	0.00	0	38870	1.00	1935
17	233	0.10	36	451	0.20	13	955	0.42	19	649	0.28	5	2289	1.00	73
18	3654	0.20	562	6394	0.35	183	8221	0.45	164	0	0.00	0	18269	1.00	909
19	352	0.10	54	680	0.20	19	1442	0.42	29	980	0.28	8	3454	1.00	111
20	616	0.10	95	1191	0.20	34	2523	0.42	50	1715	0.28	14	6044	1.00	194
21	1571	0.10	242	3036	0.20	87	6434	0.42	129	4373	0.28	36	15414	1.00	494
22	3145	0.10	484	6078	0.20	174	12381	0.42	258	8754	0.28	73	30857	1.00	988
23	0	0.00	0	917	0.02	26	9173	0.20	183	35775	0.78	298	45865	1.00	508
24	7548	0.10	1161	14590	0.20	417	30918	0.42	618	21012	0.28	175	74069	1.00	2372
TOTAL	69413	0.11	10679	132516	0.21	3786	258722	0.41	5174	170378	0.27	1420	631030	1.00	21059

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Table E-10: PROJECTIONS OF TOTAL RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, SELECTED PERIODS, 1971-MATURITY

	Gross Residential Acres				
	1971-1986	1986-2001	2001-Maturity	1971-Maturity	Total Acres in Urban Place(1)
West Sector	(9,518)	(10,548)	(10,050)	(30,116)	
1. Hamilton	2,675	3,262	776	6,713	49,000
2. Burlington	838	717	353	1,908	20,320
3. North Burlington	14	200	978	1,192	9,640
4. Milton	79	46	121	246	2,800
5. Oakville	497	487	1,423	2,407	23,680
6. North Oakville	6	423	2,125	2,554	10,400
7. Mississauga	2,330	2,091	899	5,320	29,560
8. Erin Mills	1,539	2,200	1,239	4,978	10,800
9. Malton	107	220	98	425	4,080
10. Brampton-Bramalea	1,141	752	1,891	3,784	14,320
11. Georgetown	292	150	147	589	2,920
East Sector	(6,807)	(6,690)	(6,345)	(19,842)	
12. North Pickering	1,003	1,951	1,433	4,387	11,360
13. South Pickering	1,425	790	613	2,828	7,920
14. Ajax	410	374	949	1,733	10,520
15. Oshawa-Whitby	3,745	2,251	579	6,575	26,840
16. Columbus	-2	711	1,935	2,644	8,760
17. Bowmanville	215	344	-73	486	4,120
18. Audley	11	269	909	1,189	11,600
North Sector	(2,060)	(898)	(1,787)	(4,745)	
19. Woodbridge	100	106	111	317	1,120
20. Markham	279	76	194	549	3,040
21. Richmond Hill	756	310	494	1,560	5,120
22. Newmarket-Aurora	925	406	988	2,319	5,040
23. Metro Toronto	14,802	4,757	508	20,067	154,149
24. Rest of COLUC	1,763	1,277	2,369	5,409	(2)
Total COLUC	34,950	24,170	21,059	80,179	(2)

(1) Total acreage includes all built-up and vacant land in each urban place.

(2) Not available.

Source: Tables E-7, E-8 and E-9 and COLUC Support Staff.

in the areas north of Metro Toronto.

Over the 1986-2001 and 2001-maturity periods the largest residential land requirements are anticipated in the urban places west of Metro Toronto (about 10,000-11,000 acres each period) followed by the places east of Metro Toronto (about 6,000-7,000 acres per period). Residential land requirements in Metro Toronto are projected to fall from about 4,800 acres in the 1986-2001 period to only 500 acres in the 2001-maturity period. Land requirements in the places north of Metro Toronto remain quite small over these periods.

For the entire 1971-maturity period, roughly 25 percent (20,000 acres) of total COLUC Area residential land requirements are projected to be needed in Metro Toronto. In declining order of magnitude the other urban places with significant residential land requirements over this period include Hamilton (6,713 acres), Oshawa-Whitby (6,575 acres), Mississauga (5,320 acres), Erin Mills (4,978 acres) and Brampton-Bramalea (3,784 acres).

It should be noted that for most urban places residential land requirements over the 1971-maturity period are substantially less than the total acreage within the urban place (Table E-10).

The reader is cautioned that these residential land requirements projections by urban place are the product of a technique involving many assumptions. While these underlying assumptions represent our "best estimates" of probable future trends in such variables as average household size and housing mix by urban place, it is important

that the projections be treated as rough approximations of probable residential land requirements by urban place.

TECHNICAL APPENDIX F

ALTERNATIVE PROJECTIONS OF HOUSING AND RESIDENTIAL LAND REQUIREMENTS, COLUC AREA AND BY URBAN PLACE

The two preceding appendices described our "best estimates" of residential land requirements, both for the overall COLUC Area and for 23 urban places within the COLUC Area. These "best estimates" are based upon the population projections provided us by the COLUC Support Staff and the assumption that the future impact of government on the COLUC Area housing and land markets will not be materially different from that of the past decade or two.

Reviewers of our First Phase Report have suggested several alternative scenarios which they believe should be considered in the study. The impact of these alternatives on residential land requirements are assessed in this appendix.

1. TOTAL RESIDENTIAL LAND REQUIREMENTS IN THE COLUC AREA

A total of five alternatives to our "best estimate" of future residential land requirements are analyzed. Each of these alternatives and their implications for housing requirements by type and residential land requirements in the overall COLUC Area are described below.

Alternative A

This alternative assumes that the appropriate age distribution of the COLUC Area population in 1986 is the distribution for the Hamilton-Toronto Census Metropolitan Areas prepared recently by Central Mortgage and Housing Corporation rather than the distribution given the consultant by the COLUC Support Staff.* Table A-3 of Technical Appendix A compared these two projections of the age distribution of the 1986 COLUC Area population.

As Table F-1 indicates, the two projections differ in that the CMHC projection has considerably more persons in the "15-24" and "25-34" age groups and fewer persons in the remaining five age groups. Substitution of the CMHC age projection increases the 1986 forecast of total households in the COLUC Area by 34,000 households (or about 5 percent).

Use of the CMHC projection lowers new housing requirements for family-type accommodation by 23,000 units and increases high rise housing requirements by 57,000 units. Total residential land requirements over the 1971-1986 period are reduced by about 5 percent to approximately 33,000 acres.

Alternative B

Several reviewers of our First Phase Report were of the opinion that our "best estimate" projections of the number of non-

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*The CMHC projection of the population age distribution is not available for years beyond 1986.

Table F-1: COMPARISON OF SELECTED COLUC AREA PROJECTIONS OVER THE 1971-1986 PERIOD, BEST ESTIMATE AND ALTERNATIVE A(1)

Age Distribution of COLUC Area Population in 1986 (000's of Persons)

	0-14	15-24	25-34	35-44	45-54	55-64	65 and over	Total
Best Estimate	1,013	671	737	684	478	412	390	4,386
Alternative A	930	724	947	675	412	360	338	4,386
Difference	-83	53	210	-9	-66	-52	-52	--

Increase in Number of Households 1971-1986 (Households)

	Family Households	Non-Family Households	Total
Best Estimate	441,000	270,000	711,000
Alternative A	464,000	281,000	745,000
Difference	23,000	11,000	34,000

Housing and Land Requirements by Type 1971-1986

	Family-Type Accommodation		High-Rise Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
Housing (Dwelling Units)					
Best Estimate	138,000	91,000	331,000	178,000	738,000
Alternative A	124,000	82,000	368,000	198,000	772,000
Difference	-14,000	-9,000	37,000	20,000	34,000
Land (Gross Residential Acres)					
Best Estimate	23,000	3,640	6,620	1,483	34,743
Alternative A	20,608	3,297	7,362	1,652	32,919
Difference	-2,392	-343	742	169	-1,824

(1) Alternative A differs from the best estimate in that the age distribution of the 1986 COLUC Area population is assumed to correspond to that projected for the Hamilton-Toronto Census Metropolitan Areas in a CMHC study (see Table A-3).

Source: See text.

family households in the overall COLUC Area might be on the high side. As was pointed out in Technical Appendix A, our projection of total family households in 2001 and a projection prepared by the Metropolitan Toronto Planning Board are very similar. However, our 2001 projection of non-family households is almost 40 higher than the Planning Board's projection.

Alternative B assumes that the increase in the number of family households over the 1971-2001 period remains the same as in our "best estimate". On the other hand, non-family households are assumed to account for only 25 percent of the increase in total households over the period compared to over 35 percent in our "best estimate". Under this alternative the increase in the number of households over the 1971-2001 period is 205,000 households less than the increase under our "best estimate" (Table F-2).

In terms of housing requirements by type, it is assumed that 75 percent of the reduced number of non-family households would have lived in higher density high rise housing and 25 percent in lower density high rise housing. The reduced requirement for high rise housing diminishes total land requirements by about 4 percent to 57,000 acres over the 1971-2001 period compared to the "best estimate" projection of about 59,500 acres.

Alternative C

This alternative is similar to the "best estimate" with the exception that it is assumed the average carrying costs associated

Table F-2: COMPARISON OF SELECTED COLUC AREA PROJECTIONS OVER THE 1971-2001 PERIOD, BEST ESTIMATE AND ALTERNATIVE B(1)

Increase in Number of Households (Households)

	1971-1986			1986-2001		
	Family Households	Non-Family Households	Total	Family Households	Non-Family Households	Total
Best Estimate	441,000	270,000	711,000	463,000	235,000	698,000
Alternative B	441,000	146,000	587,000	463,000	154,000	617,000
Difference	--	-124,000	-124,000	--	-81,000	-81,000

Housing and Land Requirements by Type 1971-2001

	Family-Type Accommodation		High-Rise Housing		
	Low Density	Medium Density	Lower Density	Higher Density	Total
Housing (Dwelling Units)					
Best Estimate	220,000	243,000	633,000	380,000	1,476,000
Alternative B	220,000	243,000	579,000	219,000	1,261,000
Difference	--	--	-54,000	-161,000	-215,000
Land (Gross Residential Acres)					
Best Estimate	35,615	7,983	12,660	3,166	59,424
Alternative B	35,615	7,983	11,585	1,823	57,006
Difference	--	--	-1,075	-1,343	-2,418

(1) Alternative B differs from the best estimate in that non-family households are assumed to account for only 25 percent of the increase in total households over the 1971-2001 period.

Source: See text.

with the median value single-detached house in the COLUC Area will increase at the same rate (rather than much faster) as average family income over the 1971-2001 period. That is, the impact of the cost/income induced factor on the type of accommodation occupied by family households, included in Table D-1 of Technical Appendix D, is now assumed to be zero for each age group of family households over both the 1971-1986 and 1986-2001 periods.

Over the entire 1971-2001 period, Alternative C produces a marked increase of 434,000 units in requirements for low density housing compared to our "best estimate" (Table F-3). Concomitant sharp declines occur in the requirements for medium density and high rise housing. Total housing requirements are reduced slightly (by 26,000 units) since a lower vacancy rate is associated with low density housing.

Because of the marked shift to low density housing and also to somewhat lower densities for low and medium density housing, residential land requirements are now substantially higher compared with our "best estimate".* Over the entire 1971-2001 period total residential land requirements are 143,000 acres compared with our "best estimate" projection of about 59,500 acres.

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*Assumed densities for low density housing in the 1971-1986 and 1986-2001 periods are 5.0 and 5.5 units per acre; for medium density housing densities are assumed to be 20 and 25 units per acre in these periods. These lower densities are the result of reduced housing cost pressures under Alternative C compared to our "best estimate".

Table F-3: COMPARISON OF SELECTED COLUC AREA PROJECTIONS OVER THE 1971-2001 PERIOD, BEST ESTIMATE AND ALTERNATIVE C[1]

	Family-Type Accommodation		High-Rise Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
Housing Requirements by Type (Dwelling Units)					
1971-1986					
Best Estimate	138,000	91,000	331,000	178,000	738,000
Alternative C	325,000	69,000	238,000	102,000	734,000
Difference	187,000	-22,000	-93,000	-76,000	-4,000
1986-2001					
Best Estimate	82,000	152,000	302,000	202,000	738,000
Alternative C	329,000	110,000	194,000	83,000	716,000
Difference	247,000	-42,000	-108,000	-119,000	-22,000
1971-2001					
Best Estimate	220,000	243,000	633,000	380,000	1,476,000
Alternative C	654,000	179,000	432,000	185,000	1,450,000
Difference	434,000	-64,000	-201,000	-195,000	-26,000
Land Requirements by Type (Gross Residential Acres)					
1971-1986					
Best Estimate	23,000	3,640	6,620	1,483	34,743
Alternative C	65,097	3,452	4,759	850	74,158
Difference	42,097	-188	-1,861	-633	39,415
1986-2001					
Best Estimate	12,615	4,343	6,040	1,683	24,681
Alternative C	59,871	4,390	3,877	692	68,830
Difference	47,256	47	-2,163	-991	44,149
1971-2001					
Best Estimate	35,615	7,983	12,660	3,166	59,424
Alternative C	124,968	7,842	8,636	1,542	142,988
Difference	89,353	-141	-4,024	-1,624	83,564

(1) Alternative C differs from the best estimate in that the influence of housing cost/income effects included in Table D-1 are assumed to be nil.

Source: See text.

Alternative D

This alternative is the same as Alternative C except that the number of medium density housing units required over the 1971-2001 period is greatly enlarged at the expense of low density housing units.

Consequently, residential land requirements over the 1971-2001 period under Alternative D are significantly less than under Alternative C but higher than our "best estimate" projection. Total residential land requirements under this alternative over the 1971-2001 period are for about 90,000 acres compared to the "best estimate" projection of 59,500 acres (Table F-4).

Alternative E

The scenario portrayed by this alternative has fewer low density and very high density housing units required but more medium density units than in our "best estimate".*

Compared to the "best estimate" projection total residential land requirements over the entire 1971-2001 period is reduced by about 4,000 acres -- from 59,500 acres to 55,400 acres (Table F-5).

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*The 1971-1986 density ratios (units per acre) under this alternative are the same as the "best estimate" ratios. For the 1986-2001 period density ratios are as follows: low density - 7 units; medium density - 35 units; lower density high rise housing - 70 units; and higher density high rise housing - 140 units.

Table F-4: COMPARISON OF SELECTED COLUC AREA PROJECTIONS OVER THE 1971-2001 PERIOD, BEST ESTIMATE AND ALTERNATIVE D(1)

	Family-Type Accommodation		High-Rise Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
Housing Requirements by Type (Dwelling Units)					
1971-1986					
Best Estimate	138,000	91,000	331,000	178,000	738,000
Alternative D	147,000	250,000	234,000	103,000	734,000
Difference	9,000	159,000	-97,000	-75,000	-4,000
1986-2001					
Best Estimate	82,000	152,000	302,000	202,000	738,000
Alternative D	143,000	294,000	193,000	86,000	716,000
Difference	61,000	142,000	-109,000	-116,000	-22,000
1971-2001					
Best Estimate	220,000	243,000	633,000	380,000	1,476,000
Alternative D	290,000	544,000	427,000	189,000	1,450,000
Difference	70,000	301,000	-206,000	-191,000	-26,000
Land Requirements by Type (Gross Residential Acres)					
1971-1986					
Best Estimate	23,000	3,640	6,620	1,483	34,743
Alternative D	29,400	12,500	4,680	858	47,438
Difference	6,400	8,860	-1,940	-625	12,695
1986-2001					
Best Estimate	12,615	4,343	6,040	1,683	24,681
Alternative D	26,000	11,760	3,860	716	42,336
Difference	13,385	7,417	-2,180	-967	17,655
1971-2001					
Best Estimate	35,615	7,983	12,660	3,166	59,424
Alternative D	55,400	24,260	8,540	1,574	89,774
Difference	19,785	16,277	-4,120	-1,592	30,350

(1) Alternative D differs from Alternative C in that a sharply reduced proportion of family-type accommodation are of the low density variety while substantially more are medium density units.

Source: See text.

Table F-5: COMPARISON OF SELECTED COLUC AREA PROJECTIONS OVER THE 1971-2001 PERIOD, BEST ESTIMATE AND ALTERNATIVE E(1)

	Family-Type Accommodation		High-Rise Housing		Total
	Low Density	Medium Density	Lower Density	Higher Density	
Housing Requirements by Type (Dwelling Units)					
1971-1986					
Best Estimate	138,000	91,000	331,000	178,000	738,000
Alternative E	111,000	184,000	288,000	155,000	738,000
Difference	-27,000	93,000	-43,000	-23,000	--
1986-2001					
Best Estimate	82,000	152,000	302,000	202,000	738,000
Alternative E	74,000	258,000	244,000	162,000	738,000
Difference	-8,000	106,000	-58,000	-40,000	--
1971-2001					
Best Estimate	220,000	243,000	633,000	380,000	1,476,000
Alternative E	185,000	442,000	532,000	317,000	1,476,000
Difference	-35,000	199,000	-101,000	-63,000	--
Land Requirements by Type (Gross Residential Acres)					
1971-1986					
Best Estimate	23,000	3,640	6,620	1,483	34,743
Alternative E	18,450	7,380	5,756	1,292	32,878
Difference	-4,550	3,740	-864	-191	-1,865
1986-2001					
Best Estimate	12,615	4,343	6,040	1,683	24,681
Alternative E	10,543	7,380	3,479	1,160	22.562
Difference	-2,072	3,037	-2,561	-523	-2,119
1971-2001					
Best Estimate	35,615	7,983	12,660	3,166	59,424
Alternative E	28,993	14,760	9,235	2,452	55,440
Difference	-6,622	6,777	-3,425	-714	-3,984

(1) Alternative E differs from the best estimate in that it is assumed a relatively greater proportion of housing requirements over the 1971-2001 period will be in the form of medium density housing and densities (units per acre) will be slightly higher.

Source: See text.

Summary of Alternatives

The implications of the five alternatives on total residential land requirements in the COLUC Area over the 1971-1986, 1986-2001, and 1971-2001 periods are summarized in Table F-6.

Under Alternatives A, B and E total residential land requirements do not vary materially from our "best estimate" projections. On the other hand, land requirements are about 84,000 acres and 30,000 acres higher, respectively, under Alternatives C and D than the "best estimate" projection over the entire 1971-2001 period.

2. RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE

As Alternatives C and D are the only two alternatives considered which generate residential land requirements over the 1971-2001 period significantly different than our "best estimate" projection, detailed allocations of land requirements by urban place are made for these alternatives only.

Alternative C

This alternative, it will be recalled, is based upon the assumption that the carrying charges (i.e., mortgage principal and interest and property taxes) for the median value single-detached house in the COLUC Area and average family income will both increase at the same rate over the 1971-1986 and 1986-2001 periods. This

Table F-6: COMPARISON OF PROJECTIONS OF TOTAL RESIDENTIAL LAND REQUIREMENTS, COLUC AREA, 1971-2001

	Gross Residential Acres		
	1971-1986	1986-2001	1971-2001
Best Estimate	34,743	24,681	59,424
Alternative A	32,919	(1)	(1)
Alternative B	33,281	23,725	57,006
Alternative C	74,158	68,830	142,988
Alternative D	47,438	42,336	89,774
Alternative E	32,878	22,562	55,440

(1) Not available.

Summary of Alternatives

Alternative A: Same as "best estimate" except that projection of age distribution of the COLUC Area population in 1986 is based on a CMHC study.

Alternative B: Same as "best estimate" except that it is assumed non-family households will account for only 25 percent of the increase in total households over the 1971-1986 and 1986-2001 periods.

Alternative C: Same as "best estimate" except that it is assumed the average cost of family-type accommodation and average family income will both rise at the same rate over the 1971-1986 and 1986-2001 periods.

Alternative D: Same as Alternative C except that is is assumed relatively more of total family-type accommodation is of the medium density variety while relatively less is low density housing.

Alternative E: Same as "best estimate" except that it is assumed (a) a relatively greater proportion of housing requirements will be in the form of medium density housing and (b) densities (units per acre) are slightly higher.

assumption is in contrast to our "best estimate" assumption that carrying charges will likely increase about 50 to 60 percent more rapidly than average family income over these periods. Consequently, many more families are now likely to live in low density housing and fewer in high rise housing.

Tables F-7 and F-8 outline the projections of housing requirements by type and residential land requirements by urban place over the 1971-1986 and 1986-2001 periods for Alternative C.

In our opinion, if some major government initiative was forthcoming over the 1971-1986 period which had the effect of restricting the growth rate in carrying changes (for a median value single-detached house) to that of family income, it would not be feasible to achieve the required dwelling mix for the overall COLUC Area. That is, the indicated dwelling mix is not attainable given the population allocations by urban place provided us by the COLUC Support Staff.

The principal difficulty lies with the proportion of 1971-1986 population growth allocated to Metro Toronto. If Metro Toronto attains the population growth allocated to it by the COLUC Support Staff, an unrealistically large number of low density housing units would have to be built in Metro Toronto.

Metro Toronto has been allocated some 45 percent of total COLUC Area population growth over the 1971-1986 period. According to our calculations this translates into about 67 percent of total COLUC Area new housing requirements over the period. The more rapid increase in housing requirements in Metro Toronto is

Table F-7: ALTERNATIVE C PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1971-1986

AREA	LOW			MED			HI-RISE/LOW			HI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	29822	0.56	5964	10651	0.20	533	10651	0.20	213	2130	0.04	18	53253	1.00	6728
2	6195	0.84	1239	291	0.04	15	845	0.11	17	44	0.01	0	7375	1.00	1271
3	94	1.00	19	0	0.00	0	0	0.00	0	0	0.00	0	94	1.00	19
4	584	0.84	117	27	0.04	1	80	0.11	2	4	0.01	0	695	1.00	120
5	3678	0.84	736	173	0.04	9	502	0.11	10	26	0.01	0	4379	1.00	754
6	41	1.00	8	0	0.00	0	0	0.00	0	0	0.00	0	41	1.00	8
7	23539	0.68	4708	5539	0.16	277	4846	0.14	97	692	0.02	6	34617	1.00	5087
8	11375	0.84	2275	535	0.04	27	1552	0.11	31	81	0.01	1	13543	1.00	2333
9	793	0.84	159	37	0.04	2	108	0.11	2	6	0.01	0	944	1.00	163
10	8432	0.84	1686	397	0.04	20	1150	0.11	23	60	0.01	1	10039	1.00	1730
11	2158	0.84	432	101	0.04	5	294	0.11	6	15	0.01	0	2569	1.00	443
12	7627	0.90	1525	424	0.05	21	424	0.05	8	0	0.00	0	8475	1.00	1555
13	10840	0.90	2168	602	0.05	30	602	0.05	12	0	0.00	0	12045	1.00	2210
14	3028	0.84	606	142	0.04	7	413	0.11	8	22	0.01	0	3605	1.00	621
15	37835	0.68	7567	8902	0.16	445	7790	0.14	156	1113	0.02	9	55640	1.00	8177
16	11	1.00	2	0	0.00	0	0	0.00	0	0	0.00	0	11	1.00	2
17	1591	0.84	318	75	0.04	4	217	0.11	4	11	0.01	0	1894	1.00	326
18	71	1.00	14	0	0.00	0	0	0.00	0	0	0.00	0	71	1.00	14
19	739	0.84	148	35	0.04	2	101	0.11	2	5	0.01	0	880	1.00	152
20	2063	0.84	413	97	0.04	5	281	0.11	6	15	0.01	0	2456	1.00	423
21	5591	0.84	1118	263	0.04	13	763	0.11	15	40	0.01	0	6657	1.00	1147
22	6840	0.84	1368	322	0.04	16	933	0.11	19	49	0.01	0	8144	1.00	1403
23	148017	0.30	29603	44405	0.09	2220	202290	0.41	4046	98678	0.20	822	493390	1.00	36692
24	13035	0.84	2607	613	0.04	31	1778	0.11	36	93	0.01	1	15519	1.00	2674
TOTAL	323978	0.44	64796	73631	0.10	3682	235620	0.32	4712	103084	0.14	859	736314	1.00	74049

Table F-8: ALTERNATIVE C PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1986-2001

AREA	LOW			MED			HI-RISE/LOW			HI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	60537	0.56	11007	21620	0.20	865	21620	0.20	432	4324	0.04	36	108101	1.00	12340
2	9979	0.68	1814	1875	0.13	75	1430	0.10	29	1478	0.10	12	14762	1.00	1930
3	2616	1.00	476	0	0.00	0	0	0.00	0	0	0.00	0	2616	1.00	476
4	641	0.68	117	121	0.13	5	92	0.10	2	95	0.10	1	949	1.00	124
5	6787	0.68	1234	1275	0.13	51	973	0.10	19	1005	0.10	8	10040	1.00	1313
6	5530	1.00	1006	0	0.00	0	0	0.00	0	0	0.00	0	5530	1.00	1006
7	39008	0.68	7092	8605	0.15	344	8318	0.14	166	1434	0.02	12	57365	1.00	7615
8	30642	0.68	5571	5758	0.13	230	4392	0.10	88	4538	0.10	38	45329	1.00	5927
9	3069	0.68	558	577	0.13	23	440	0.10	9	454	0.10	4	4540	1.00	594
10	10476	0.68	1905	1968	0.13	79	1502	0.10	30	1551	0.10	13	15497	1.00	2026
11	2082	0.68	379	391	0.13	16	298	0.10	6	308	0.10	3	3080	1.00	403
12	27619	0.90	5022	1534	0.05	61	1534	0.05	31	0	0.00	0	30688	1.00	5114
13	11184	0.90	2033	621	0.05	25	621	0.05	12	0	0.00	0	12427	1.00	2071
14	5208	0.68	947	979	0.13	39	747	0.10	15	771	0.10	6	7705	1.00	1007
15	41995	0.68	7635	9263	0.15	371	8955	0.14	179	1544	0.02	13	61757	1.00	8198
16	9295	1.00	1690	0	0.00	0	0	0.00	0	0	0.00	0	9295	1.00	1690
17	4790	0.68	871	900	0.13	36	687	0.10	14	709	0.10	6	7086	1.00	927
18	3520	1.00	640	0	0.00	0	0	0.00	0	0	0.00	0	3520	1.00	640
19	1470	0.68	267	276	0.13	11	211	0.10	4	218	0.10	2	2174	1.00	284
20	1059	0.68	193	199	0.13	8	152	0.10	3	157	0.10	1	1567	1.00	205
21	4323	0.68	786	812	0.13	32	620	0.10	12	640	0.10	5	6395	1.00	836
22	5656	0.68	1028	1063	0.13	43	811	0.10	16	838	0.10	7	8367	1.00	1094
23	27920	0.10	5076	47463	0.17	1899	139598	0.50	2792	64215	0.23	535	279197	1.00	10302
24	17743	0.68	3226	3334	0.13	133	2543	0.10	51	2628	0.10	22	26247	1.00	3432
TOTAL	333148	0.46	60572	108635	0.15	4345	195544	0.27	3911	86908	0.12	724	724235	1.00	69553

attributable to the attractiveness of this area for non-family households.

To illustrate the underlying dilemma, assume for the moment that all COLUC Area requirements for high density and medium density housing over the 1971-1986 period are built in Metro Toronto (a most unlikely situation). In order for the overall COLUC Area to have 44 percent of its total housing requirements in low density housing (Table F-7), 25 percent of the units constructed in Metro Toronto would have to be low density units. In light of the high cost of serviced lots in Metro Toronto and available vacant acreage, this proportion of low density housing is not practical. The only way for the COLUC Area to get 44 percent of its total housing requirements in low density units is to reduce the population allocation for Metro Toronto and to increase the allocations in outlying areas where this type of housing is more likely to be built.

Since it is not realistic for all medium and high density housing to be constructed in Metro Toronto, Table F-7 allocates a modest amount of these housing types to selected other urban places. This results in the need for 30 percent of all housing constructed in Metro Toronto between 1971 and 1986 to be low density units. Almost 37,000 acres of residential land would be required in Metro Toronto over this period (compared to a "best estimate" projection of about 15,000 acres).

Over the 1986-2001 period, it is projected that at a minimum 10 percent of housing units constructed in Metro Toronto would have to be low density units (Table F-8). Residential land requirements over the period would be about 10,000 acres.

For Alternative C to be implemented then, our calculations indicate that about 47,000 acres of new residential land would be needed in Metro Toronto. Since this is not a viable proposition, two options are available: (a) reduce the population allocation of Metro Toronto or (b) reduce the proportion of low density units in total COLUC Area housing requirements. The COLUC Support Staff requested that we consider the latter option, which is our Alternative D.

Alternative D

With this alternative the proportion of total housing requirements in each period accounted for by high rise housing in the overall COLUC Area is held the same as in Alternative C but a smaller share of family-type accommodation is in the form of low density units and more are medium density units:

	Family-Type Accommodation as Percent of Total Housing Requirements					
	Low Density	Medium Density	Total	Low Density	Medium Density	Total
Alternative C	44	10	54	46	15	61
Alternative D	20	34	54	20	41	61

Tables F-9, F-10, and F-11 summarize the Alternative D

Table F-9: ALTERNATIVE D PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1971-1986

AREA	LOW			MED			HI-R			-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	10651	0.20	2130	29822	0.56	1491	10651	0.20	213	2130	0.04	18	53253	1.00	3852
2	7149	0.97	1430	30	0.00	2	152	0.02	3	44	0.01	0	7375	1.00	1435
3	84	0.90	17	9	0.10	0	0	0.00	0	0	0.00	0	94	1.00	17
4	674	0.97	135	3	0.00	0	14	0.02	0	4	0.01	0	695	1.00	135
5	4244	0.97	849	18	0.00	1	90	0.02	2	26	0.01	0	4379	1.00	852
6	37	0.90	7	4	0.10	0	0	0.00	0	0	0.00	0	41	1.00	8
7	10385	0.30	2077	18693	0.54	935	4846	0.14	97	692	0.02	6	34617	1.00	3114
8	13128	0.97	2626	56	0.00	3	278	0.02	6	81	0.01	1	13543	1.00	2635
9	915	0.97	183	4	0.00	0	19	0.02	0	6	0.01	0	944	1.00	184
10	9731	0.97	1946	41	0.00	2	206	0.02	4	60	0.01	1	10039	1.00	1953
11	2490	0.97	498	11	0.00	1	53	0.02	1	15	0.01	0	2569	1.00	500
12	5509	0.65	1102	2542	0.30	127	424	0.05	8	0	0.00	0	8475	1.00	1237
13	7829	0.65	1566	3613	0.30	181	602	0.05	12	0	0.00	0	12045	1.00	1759
14	3495	0.97	699	15	0.00	1	74	0.02	1	22	0.01	0	3605	1.00	701
15	16692	0.30	3338	30046	0.54	1502	7790	0.14	156	1113	0.02	9	55640	1.00	5006
16	10	0.90	2	1	0.10	0	0	0.00	0	0	0.00	0	11	1.00	2
17	1836	0.97	367	8	0.00	0	39	0.02	1	11	0.01	0	1894	1.00	368
18	64	0.90	13	7	0.10	0	0	0.00	0	0	0.00	0	71	1.00	13
19	853	0.97	171	4	0.00	0	18	0.02	0	5	0.01	0	880	1.00	171
20	2381	0.97	476	10	0.00	1	50	0.02	1	15	0.01	0	2456	1.00	478
21	6453	0.97	1291	27	0.00	1	137	0.02	3	40	0.01	0	6657	1.00	1295
22	7894	0.97	1579	34	0.00	2	167	0.02	3	49	0.01	0	8144	1.00	1584
23	19736	0.04	3947	165286	0.33	8264	209691	0.42	4194	98678	0.20	822	493390	1.00	17228
24	15043	0.97	3009	64	0.00	3	319	0.02	6	93	0.01	1	15519	1.00	3019
TOTAL	147263	0.20	29453	250347	0.34	12517	235620	0.32	4712	103084	0.14	859	736314	1.00	47541

Table F-10: ALTERNATIVE D PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 1986-2001

AREA	LOW			MED			HI-RISE/LOW			HI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	10810	0.10	1965	43240	0.40	1730	43240	0.40	865	10810	0.10	90	108101	1.00	4650
2	7999	0.54	1454	6358	0.43	254	372	0.03	7	33	0.00	0	14762	1.00	1716
3	1047	0.40	190	1047	0.40	42	523	0.20	10	0	0.00	0	2616	1.00	243
4	514	0.54	93	409	0.43	16	24	0.03	0	2	0.00	0	949	1.00	110
5	5441	0.54	989	4324	0.43	173	253	0.03	5	22	0.00	0	10040	1.00	1167
6	2212	0.40	402	2212	0.40	88	1106	0.20	22	0	0.00	0	5530	1.00	513
7	11473	0.20	2086	25814	0.45	1033	17209	0.30	344	2868	0.05	24	57365	1.00	3487
8	24563	0.54	4466	19522	0.43	781	1143	0.03	23	101	0.00	1	45329	1.00	5271
9	2460	0.54	447	1955	0.43	78	114	0.03	2	10	0.00	0	4540	1.00	528
10	8398	0.54	1527	6674	0.43	267	391	0.03	8	35	0.00	0	15497	1.00	1802
11	1669	0.54	304	1327	0.43	53	73	0.03	2	7	0.00	0	3080	1.00	358
12	9206	0.30	1674	13810	0.45	552	7672	0.25	153	0	0.00	0	30688	1.00	2380
13	3728	0.30	678	5592	0.45	224	3107	0.25	62	0	0.00	0	12427	1.00	964
14	4175	0.54	759	3318	0.43	133	194	0.03	4	17	0.00	0	7705	1.00	896
15	12351	0.20	2246	27790	0.45	1112	18527	0.30	371	3088	0.05	26	61757	1.00	3754
16	3718	0.40	676	3718	0.40	149	1859	0.20	37	0	0.00	0	9295	1.00	862
17	3840	0.54	698	3052	0.43	122	179	0.03	4	16	0.00	0	7086	1.00	824
18	1408	0.40	256	1408	0.40	56	704	0.20	14	0	0.00	0	3520	1.00	326
19	1178	0.54	214	936	0.43	37	55	0.03	1	5	0.00	0	2174	1.00	253
20	849	0.54	154	675	0.43	27	40	0.03	1	3	0.00	0	1567	1.00	182
21	3465	0.54	630	2754	0.43	110	161	0.03	3	14	0.00	0	6395	1.00	744
22	4534	0.54	824	3603	0.43	144	211	0.03	4	19	0.00	0	8367	1.00	973
23	5584	0.02	1015	106095	0.38	4244	97719	0.35	1954	69799	0.25	582	279197	1.00	7795
24	14223	0.54	2586	11304	0.43	452	662	0.03	13	59	0.00	0	26247	1.00	3052
TOTAL	144847	0.20	26336	296937	0.41	11877	195544	0.27	3911	86908	0.12	724	724235	1.00	42848

Table F-11: ALTERNATIVE D PROJECTIONS OF NEW HOUSING REQUIREMENTS BY TYPE AND RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, 2001-MATURITY

AREA	LOW			MED			HI-RISE/LOW			HI-RISE/HIGH			TOTAL		
	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES	UNITS	P.C.	ACRES
1	4552	0.10	828	18208	0.40	728	18208	0.40	364	4552	0.10	38	45521	1.00	1958
2	1658	0.15	302	4495	0.41	180	2922	0.26	58	1964	0.18	16	11039	1.00	556
3	7862	0.40	1430	7862	0.40	314	3931	0.20	79	0	0.00	0	19656	1.00	1823
4	568	0.15	103	1541	0.41	62	1002	0.26	20	673	0.18	6	3784	1.00	191
5	6677	0.15	1214	18098	0.41	724	11765	0.26	235	7906	0.18	66	44446	1.00	2239
6	17077	0.40	3105	17077	0.40	683	8538	0.20	171	0	0.00	0	42691	1.00	3959
7	5960	0.20	1084	13409	0.45	536	8940	0.30	179	1490	0.05	12	29799	1.00	1811
8	5813	0.15	1057	15757	0.41	630	10243	0.26	205	6884	0.18	57	38698	1.00	1949
9	461	0.15	84	1251	0.41	50	813	0.26	16	546	0.18	5	3071	1.00	155
10	8871	0.15	1613	24044	0.41	962	15630	0.26	313	10504	0.18	88	59049	1.00	2975
11	690	0.15	126	1871	0.41	75	1216	0.26	24	817	0.18	7	4595	1.00	231
12	10361	0.30	1884	15542	0.45	622	8634	0.25	173	0	0.00	0	34537	1.00	2678
13	4433	0.30	806	6650	0.45	266	3694	0.25	74	0	0.00	0	14777	1.00	1146
14	4453	0.15	810	12069	0.41	483	7846	0.26	157	5273	0.18	44	29641	1.00	1493
15	3835	0.20	697	8628	0.45	345	5752	0.30	115	959	0.05	8	19173	1.00	1165
16	15548	0.40	2827	15548	0.40	622	7774	0.20	155	0	0.00	0	38870	1.00	3604
17	344	0.15	63	932	0.41	37	606	0.26	12	407	0.18	3	2289	1.00	115
18	7307	0.40	1329	7307	0.40	292	3654	0.20	73	0	0.00	0	18269	1.00	1694
19	519	0.15	94	1406	0.41	56	914	0.26	18	614	0.18	5	3454	1.00	174
20	908	0.15	165	2461	0.41	98	1600	0.26	32	1075	0.18	9	6044	1.00	304
21	2316	0.15	421	6276	0.41	251	4080	0.26	82	2742	0.18	23	15414	1.00	777
22	4636	0.15	843	12565	0.41	503	8168	0.26	163	5489	0.18	46	30857	1.00	1555
23	917	0.02	167	17429	0.38	697	16053	0.35	321	11466	0.25	96	45865	1.00	1281
24	11127	0.15	2023	30160	0.41	1206	19606	0.26	392	13176	0.18	110	74069	1.00	3731
TOTAL	126206	0.20	22947	258722	0.41	10349	170378	0.27	3408	75724	0.12	631	631030	1.00	37334

projections of housing requirements by type and residential land requirements by urban place over the 1971-1986, 1986-2001 and 2001-maturity periods. Table F-12 summarizes the projection of total residential land requirements over the entire 1971-maturity period.

In the 1971-1986 period it is projected that under this alternative some 17,000 acres of residential land will be needed in Metro Toronto (Municipality of Metropolitan Toronto plus northern fringe area), about 15,000 acres in the West Sector, 9,000 acres in East Sector and 3,500 acres in the North Sector.

In the 1986-2001 and 2001-maturity periods residential land requirements in Metro Toronto drop sharply to less than 8,000 acres and 1,300 acres respectively. Acreage requirements in the three sectors over each of these periods generally correspond quite closely with the 1971-1986 requirements.

Table F-12: ALTERNATIVE D PROJECTIONS OF TOTAL RESIDENTIAL LAND REQUIREMENTS BY URBAN PLACE, COLUC AREA, SELECTED PERIODS, 1971-MATURITY

	Gross Residential Acres				
	1971-1986	1986-2001	2001-Maturity	1971-Maturity	Total Acres in Urban Place(1)
West Sector	(14,685)	(19,845)	(17,847	(52,377	
1. Hamilton	3,852	4,650	1,958	10,460	49,000
2. Burlington	1,435	1,716	556	3,707	20,320
3. North Burlington	17	243	1,823	2,083	9,640
4. Milton	135	110	191	436	2,800
5. Oakville	852	1,167	2,239	4,258	23,680
6. North Oakville	8	513	3,959	4,480	10,400
7. Mississauga	3,114	3,487	1,811	8,412	29,560
8. Erin Mills	2,635	5,271	1,949	9,855	10,800
9. Malton	184	528	155	867	4,080
10. Brampton-Bramalea	1,953	1,802	2,975	6,730	14,320
11. Georgetown	500	358	231	1,089	2,920
East Sector	(9,082)	(10,006)	(11,665)	(30,753)	
12. North Pickering	1,237	2,380	2,678	6,295	11,360
13. South Pickering	1,759	964	1,146	3,869	7,920
14. Ajax	701	896	1,493	3,090	10,520
15. Oshawa-Whitby	5,006	3,754	1,165	9,925	26,840
16. Columbus	-2	862	3,604	4,464	8,760
17. Bowmanville	368	824	-115	1,077	4,120
18. Audley	13	326	1,694	2,033	11,600
North Sector	(3, 528)	(2,152)	(2,810)	(8,490)	
19. Woodbridge	171	253	174	598	1,120
20. Markham	478	182	304	964	3,040
21. Richmond Hill	1,295	744	777	2,816	5,120
22. Newmarket-Aurora	1,584	973	1,555	4,112	5,040
23. Metro Toronto	17,228	7,795	1,281	26,304	154,149
24. Rest of COLUC Area	3,018	3,050	3,731	9,799	(2)
Total COLUC Area	47,541	42,848	37,334	127,723	(2)

(1) Total acreage includes all built-up and vacant land within each urban place.
(2) Not available.

Source: Appendix Tables F-9, F-10, F-11, and COLUC Support Staff.

REFERENCE COPY

HT/395/.C32/.COLUC591/1974
Ontario. Central Ontario Lakesh
Projections of housing and
residential land requirements
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and residential land requirements in the COLUC area.

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BFS - RED
BGS - BLACK
BDS - GREY
BUS - BLUE
BPS - GREEN
BYS - YELLOW
BAS - TANGERINE
BBS - ROYAL BLUE
BXS - EXECUTIVE RED

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